THE ENGINEERING AND MINING JOURNAL.

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NOTE.—Communications relative to the editorial management should be addressed to Mr. ROTHWELL. The articles written by Mr. Raymond will be signed with a star.

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AMERICAN INSTITUTE OF MINING ENGINEERS.

THE Washington meeting will commence on Tuesday evening, February 22, 1876, at 8 o'clock, P. M., at the Smithsonian Institute, Washington, D. C.

The Ebbitt House has been selected as a rendezvous.

THE supplement enclosed with this number of the ENGINEERING AND MINING JOURNAL should have accompanied Mr. FIRMSTONE'S paper on "A Comparison of Open-Topped and Closed-Topped Furnaces," published last week. By an unfortunate mishap, the supplement was not ready in time. Our readers can file it where it belongs, facing page 154.

THE COAL CONTRACTS OF THE PHILADELPHIA GAS TRUST.

FOR many years the Philadelphia Gas Trust has had, whether deservedly or not we do not presume to decide, an exceedingly bad reputation for honesty. It has been repeatedly shown that it pays much more for its coal than other large gas works, and it has been more than intimated that by the revolutions of the "wheels within wheels," the trustees go into office poor and come out rich.

This curious result is so frequently witnessed in the working of the machinery of Municipal and other public works, that the facts charged do not appear altogether improbable.

A few weeks ago (Feb. 5th) we noted the sales of about 200,000 tons of gas coals to the New York companies at $6 per ton of 2240 lb. delivered here.

This price is equivalent to about $4.50 at Baltimore, and $4.70 per gross ton at Philadelphia. The coals to be supplied are Penn and Westmoreland, Youghiogheny and some West Virginia, mined on the line of the B. and O. RR. All these are ranked as the best American gas coals, and are the same as used in the Philadelphia gas works.

It appears the Philadelphia Gas Trust, January 14th, invited certain of the Gas Coal Companies to tender for the supply of 250,000 tons (2,000 *lb. to the ton*) of coal for the use of the works during the present year. The following bids were received:

	Per 2000 lb.		Per 2240 lb.
Penn Gas Coal Company	$6 00	equal to	$6 72
Westmoreland Coal Company	6 00	"	6 72
Shafton " "	5 98	"	6 69
Thomas Moore	6 10	"	6 83
White & Heath	6 00	"	6 72
A subsequent bid by Thomas Moore	5 00	"	5 60

There are several noticeable points in these bids.

Though they are all very much higher than the prices at which the same parties have sold their coal to the New York Gas Companies, and, therefore, presumably have a very large margin for profit, yet the prices named are almost identical. A difference of two cents below the average (when the profit apparently considerably over $1 per ton) was sufficient to give one company a small contract. The whole thing looks very suspicious, almost as if the parties were told what to bid, or else there is somewhere an item of cost, in the form of "commission" or otherwise, that does not appear on the surface and that reduces the price actually received by the mining companies to very near the cost of production.

The contracts were made with the Shafton Coal Company for 30,000 net tons at $5 98, and with the Penn and Westmoreland equally for the balance of the 250,000 tons at $6 per 2,000 lb., or $6 72 per 2,240 lb., that is 72 cents per ton more than was paid for the same coal delivered here in New York, though the freight from Greenwich to this city amounts usually to $1.15 to $1.30 per ton. If we deduct this freight from the price paid in New York we find the Philadelphia Gas Trust paid, say, $2.00 per ton more than the New York Companies. This would be equivalent to $500,000 on the purchase of 250,000 tons. This, however, is not a fair, though a plausible, statement of the case, for the Pennsylvania R.R. is supposed to allow a "drawback" on coal sent beyond Philadelphia. What the amount of this is we do not know, but it seems probable that after allowing for it there would still be a very handsome margin. This view of the case is confirmed by the fact that Mr. THOMAS MOORE made a subsequent offer of Youghiogheny coal at $5.60 per ton of 2240, but as he was unable to deliver it by rail his bid was not accepted.

The question which naturally suggests itself is, Why does the Philadelphia Gas Trust pay, say, $2.00 per ton more than the New York companies for the same coals at the same point? There may be "good and sufficient reasons" for its doing so, but in that event it would relieve the anxiety of its friends and silence its enemies by making them known.

THE HEAT OF SLAGS AND ECONOMY OF FURNACES.

FROM two recent papers of Prof. GRUNER we obtain the following interesting data. The experiments on which they are based were made with a water calorimeter of 18 kilogrammes weight, and upon quantities of molten material varying from 50 to 500 grammes. The heat is given in French calories, or centigrade units.

The less fusible slags of blast-furnace (accompanying gray pig) possess, on issuing from the furnace, 450 to 500 units. Those proceeding from non-fusible ores and most frequently associated with white pig, have 400 to 450; white glass (70 per cent. silica) heated to the temperature for glass-blowing, 415 to 420; bottle-glass under the same circumstances, 380 to 400. The ferruginous and manganiferous scoriæ from the MARTIN process (54 to 55 per cent. silica) require for smelting, 410 to 415 units; porphyroidal copper-slags from Swansea, (60 per cent. silica and quartz) 405 to 410; bisilicate protoxide of iron slags (45 per cent. silica) 380 to 400; puddling or reheating cinder (30 to 35 per cent. silica) 320 to 330; monosilicate slags from lead and copper furnaces (28 per cent. silica) 275 to 300. Pure, well carburized pig requires for melting 225 to 230 units; gray silicious pig (3 per cent. carbon), 250; red copper, which, like the foregoing, has its melting point at about 1,200° centigrade, may be brought to that temperature with 160 to 165 units of heat. Iron-copper-matte requires 230 to 240; iron-lead-matte, 200. Lead, which has, like platinum, a very low specific heat, can be brought to clear orange redness with 45 to 50 units.

From the foregoing figures, and other researches which he has previously made public, Prof. GRUNER has deduced the following interesting statements:

In the wind-furnace, which is from this point of view the most imperfect apparatus, there is utilized, in the fusion of steel in crucibles, but 1·7 of the total heat-capacity, of the fuel, or at most 3 per cent. of the heat generated. In the reverberatory, when steel is melted in crucibles, the useful effect is 2 per cent. of the total heat, or 3 per cent. of the heat generated. In the SIEMENS crucible furnaces, 3 to 3·5 per cent.; in SIEMENS glass-furnaces, operating on a large scale, 5·50 to 6 per cent.; in ordinary glass furnaces, 3 per cent.; in fusion upon the open hearth of a reverberatory, of glass, 7 per cent.; of iron, 8 per cent.; in well-arranged SIEMENS and PONSARD furnaces, up to 15, 18, and even 20 per cent. of the total heat is utilized.

The caloric effect is much greater, when the fuel is mixed with the material to be fused. In the old cupolas, 29 to 30 per cent., and in modern cupolas, higher, more rapid in working, and narrower in zone of fusion, upwards of 50 per cent. is realized. Large iron blast-furnaces utilize, according to their working, 70 to 80 per cent. of the heat generated, or 34 to 36 per cent. of the total heat which the complete combustion of the fuel would set free. *

THE FRYER PROCESS AND ITS FRIENDS.

IN our article of January 15, we commented upon this process, so far as it had been made public, explicitly declaring that we had nothing before us except the description and drawing of the roasting apparatus given in the patent of Mr. FRYER. We admitted that this might be an imperfect one, although, of course, if the patent is to be held valid, it ought to give a description which would permit any expert metallurgist to operate the process. This is the sole consideration on which an inventor is protected by law. He gives the knowledge of his invention completely to the public; and the law, in return, secures to him the right of property in it for a certain period. But the patent before us did not give the details of the whole process; and we could not therefore, and did not, criticize the whole process. We have since been overwhelmed with criticisms and replies, challenges and defiances, to which we pay no attention, for two sufficient reasons. First, we decline to allow ourselves to be put in the position of condemning Mr. FRYER'S whole process, before we know what it is. Secondly we do not regard asseverations of success, while the details are kept secret, as evidence worthy of our regard.

Processes heralded with glowing but mysterious announcements, as revolutionizing the art of metallurgy, are usually swindles. Mr. FRYER'S enterprise having been unfortunately attended with some of these features, we took pains to say that we did not rank it in that class. We know some of the parties concerned in it, and believe them to be quite sincere. We had, moreover, the impression that they gave proof of their sincerity by spending their own money and not trying to sell stock to an uninformed public. Those who have since intimated to us that this is not the case, that the company is secretly selling stock, and that our article has damaged its interests in that respect, are hereby informed that we shall pay no attention to such vague insinuations. So far as we know, the company is clearly and fully entitled to the credit we have given it.

The Grass Valley *Union* of February 1st contains a communication, signed "Fair Play," and sent to us with the following gentlemanly remark, pencilled on the margin, in violation of the postal law: "*Ans. this if you can. You can't blackmail us.*" We should, perhaps, do the company an injustice, if we assumed from the concluding word of this remark that it is at all official. The company must be better informed as to this point, as one of its officers may well testify, who, after the appearance of the first article in our columns, called upon the

editor, urgently inviting him to visit the office, and adding that, of course, the company would wish to advertise in THE ENGINEERING AND MINING JOURNAL. We do not charge the company with any attempt at bribery on account of such a casual remark; why should the company suspect us of blackmail, on account of a candid criticism? As for the unknown champion of Mr. FRYER who descends to such insinuations, he should be cautioned by the rest of the people included in his "us," that nothing is to be gained by talking about blackmail in an argument on metallurgy with this Journal. It may be possible to show that we have erroneously understood the claims and features, or on incomplete evidence prematurely judged the results, of a given process; but this must be done with facts and figures. Charges of improper motives are ridiculous and impertinent.

So far as facts and figures are concerned, the article of "Fair Play" contains very few. What there is in it of argument or information, aside from personal abuse of the editor, and misrepresentation of the article, of this journal, we shall now "*Ans.*"

"Fair Play" wants to know, if our rule is not to discuss secret inventions, why we departed from it. *Ans.* We did not depart from it! We discussed nothing but Mr. FRYER's patent for a roasting-furnace.

"Fair Play" does not see the pertinency of our remark that failures in roasting preliminary to amalgamation have largely resulted from the ignorance of the experimenters. *Ans.* This remark is part of our opinion that the great number of failures in this direction does not prove the idea of roasting and amalgamation to be necessarily impracticable.

"Fair Play" says that we could have easily satisfied ourselves as to the successful roasting, by calling at the New York office of the company and *inspecting samples! Ans.* It is respectfully denied that inspecting samples in the New York office would give us any satisfaction on this point.

"Fair Play" says we "repudiate the idea that gold ores may be roasted without volatilization and absorption," and also, that we could have been satisfied on *this* point by inspecting samples. *Ans.* We pronounced the claim above quoted to be, "so far as gold is concerned, not far from nonsense," because there is in the ordinary roasting of gold ores no volatilization of the metal; while, as to absorption in this connection, we do not know, and nobody can tell us, what it means. After inspecting such a sample of scientific English, it is quite unnecessary to look at any samples of non-volatilized and non-absorbed gold.

"Fair Play" objects to the "trundle-bottom," as a "jocular allusion." *Ans.* We withdraw the trundle-bottom.

"Fair Play" says that in the treating of over 1,200 samples, during three months, "sometimes in the presence of well-known mining men and journalists," there has been no detection of flue dust in the annular chamber, or of a "mass of slag, matte, cinders and ashes in the bottom of the furnace. *Ans.* The word "samples" is rather vague; but we find in the same number of the *Union* an extract from the Gold Hill *News* of Nevada, which furnishes a sample of these samples; and our unknown friend calls our attention to this extract specially, in the pencilled words, "*What have you got to say to this, old Smarty?*" On analysis of this item, it appears that "MR. WILLIAM HENRY, the gentlemanly agent of the Gold Hill depot of Virginia and Truckee Railroad," showed to the editor or reporter of a Nevada paper "the results of the working of *eighteen pounds* of ore" by the Fryer process in Grass Valley, California. We are told that this was very refractory silver ore; nothing is said of its mineralogical character, nothing of its original assay value, nothing of the treatment it received; only this: that it yielded $54.98 in gold and silver, of which only $2.48 was gold, and that the bullion was absolutely free from base metal. In all this there is but one fact from which any conclusion can be drawn, namely, the alleged purity of the bullion. If this ore contained any considerable quantity of base metals, and the bullion-button carried around by Mr. WILLIAM HENRY had not been refined after amalgamation, then every metallurgist knows that the purity of the bullion must have been secured at the cost of a loss of silver. But the main point is, that 18 pounds appears to have been the size of the "sample." Now 1,200 or 12,000 such samples do not touch the question of steady operations on a large scale. They tell us nothing at all.

With regard to flue-dust at the top and matte and cinder at the bottom of Mr. FRYER,s apparatus, it is quite possible that we have expressed ourselves so as to be misunderstood by "Fair Play;" though no trained metallurgist could have misunderstood us. We do not expect flue-dust or matte from lump-ore containing but a subordinate proportion of sulphurets. But in using ores of that kind, if there is no flue-dust, then the annular chamber of Mr. FRYER is useless. Our whole criticism in this respect is based upon the avowed high temperature and strong draft of his apparatus, applied to certain classes of ores. If he does not treat such ores, or if he does not maintain such conditions, then the criticism falls to the ground—and so does a part of his apparatus, which becomes superfluous.

In conclusion, we have no controversy with Mr. FRYER, and we are sorry to be forced into a controversy with his volunteer champions. Our columns are, and have always been, open to him for any statement of facts or candid and courteous argument. We continue to receive from intelligent friends in the West, assurances of his practical success; and we shall make haste to publish the first accurate and trustworthy information we can obtain, and to give Mr. FRYER all the credit which his perseverance and ingenuity may deserve. It is his misfortune that, while apparently absorbed himself in *bona fide* experiments and in perfecting the details of practice, the "well-known mining men and journalists" admitted to his works come away and write such trash about the process. Why should he or his company permit a meritorious enterprise to be disgraced by a system of puffing and a blackguardism in reply to honest dissent, which have hitherto been deemed the peculiar characteristics of empty and speculative schemes only?

*

THE COAL AND IRON EXCHANGE BUILDING.

ONE of the finest of the many magnificent buildings erected in this city within the past few years is that of the Delaware and Hudson Canal Co., known as the "Coal and Iron Exchange." It is situated on the corner of Cortlandt and New Church Streets, a very convenient location. Coal, iron, and railroad offices being near the new Post Office, Wall street, the Custom House, and the ferries of the several roads terminating in Jersey City.

The accompanying view gives a very good idea of this magnificent business building, the simplicity of its architecture is scarcely less noticeable than its solidity and massiveness—it conveys at once the impression that its originators are plain, solid business men, who hold usefulness in higher appreciation than ornament, and, indeed, the object most studiously kept in view in its design we are told was to make it the nearest fire-proof, best built and most thoroughly lighted, heated and ventilated office building of large dimensions that has ever been erected in the city of New York.

The lot occupied by the building is 143 feet 10 inches on Cortlandt Street by 105 feet 6 inches on New Church street. The following particulars of its construction and arrangement are interesting in an engineering sense, and give a good idea of the present most advanced point in the architecture of this city:

The foundations of the building are composed of Portland cement concrete, starting 19 ft. 6 in. below the sidewalk on Church Street, in widths varying from 8 to 10 ft. The thickness or height of the concrete is 7 ft. 6 in. It forms one solid mass under all walls, having been laid simultaneously, throughout the breadth of the building, in layers 6 in. thick. The concrete was mixed by machinery, and rammed into the trenches. The front walls start with a layer of granite 16 in. thick, in one piece under each pier, resting on top of the concrete; while the interior and rear walls begin at this level with their brick-work, in a general thickness of 4 ft. The experiences of the great fires of Chicago and Boston have shown that cast iron supports are far from satisfactory when subjected to a fire, hence, in this building, solid brick piers have been substituted for them. These piers are connected in each story by segmental arches, which support the floors and partitions. The easterly part of the building has solid brick walls as supports for its interior. These brick piers rest, in the first place, upon a bed of concrete 2 ft. thick. Then follow granite slabs 10×8 ft., 12 in. thick. On top of these slabs rest the granite skew-backs for the inverted arches, which connect the foundations of the piers, in order to distribute the heavy weight equally over a larger surface. These piers, as well as the piers of the front, have granite bond stones 12 in. thick in the cellar. Where the front piers are exposed to view from the outside, in the areas below the sidewalk, they are faced with granite to the whole height of the cellar wall. All brick-work of the piers to the level of the sidewalk is laid in Portland cement.

The materials used for the fronts of the building are Nova Scotia sandstone and Baltimore pressed brick. The basement story is carried up in solid blocks of stone, resting upon a granite base course. These stones lie on their natural beds, and bind almost through the entire thickness of the walls. Each stone presents on its face a raised tablet; and the wall, to the whole height of the basement, has a batter which gives to the building a character of firmness and strength. From the level of the first story windows, the fronts are mainly constructed of brick, with the exception of the window mullions, sills and lintels, which are of stone. The window trimmings of the first story are of cast iron, which material allows the trimmings to be made smaller, in order to admit light with the least obstruction.

The brick-work is a master-piece of workmanship. Every other layer is a header course, binding in with the interior brick-work of the front walls. The front bricks are laid in black mortar, made principally of French Lafarge cement. The main cornice, projecting out on stone corbels, contains the copper-lined gutters. To either side of the Courtlandt Street front, pavilions project, with their brick and stone work above the main cornice. They are covered with Mansard roofs sloping towards the four sides, and with a flat deck, upon which the flag-staffs are placed. Between these pavilions extends the Mansard roof, with its solid stone and brick dormer windows, and a handsome deck cornice.

The building, as it appears from the street, has a cellar, basement, five stories and an attic. Towards the southeasterly part, in the rear, the building is, however, six stories high, with an attic above. The height of the main cornice from the sidewalk is 80 ft., to the deck cornice of the Mansard 105 ft., and to the top of the pavilions 134 ft., above which the flagstaffs reach 45 ft. more, thus making the highest point of the building 179 ft. from the street.

THE INTERIOR.—The height of the cellar is 11½ ft. in the clear. It contains the steam-heating apparatus, consisting of four horizontal tubular boilers with many heating chambers for warming the basement and first story by indirect radiation; a vast system of steam, water, and gas pipes, all accessible to the engineer; two elevator engines; the pumps for conveying the water from the receiving tank to the tanks in the attic; and two chemical fire extinguishers, with two stand-pipes, having the outlets in each story provided with fire hose. To these stand-pipes, for additional aid when needed, are also connected one of the large pumps and a steam-pipe. So that, in case of a fire, the chemical fire extinguisher, steam, or water may be used as occasion may require.

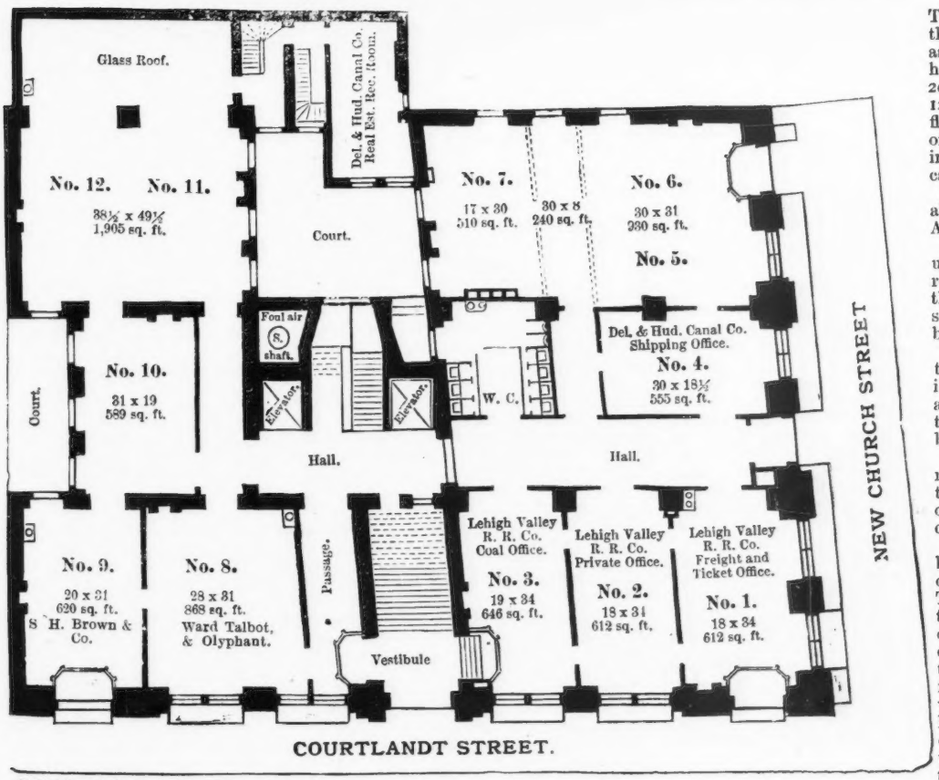
THE BASEMENT is, in its westerly part, 13 ft. 2 in. high; and in its easterly part, 12 ft. high. The corner suite of rooms has been rented to the Lehigh Valley Railroad Company for a long period of years. In the eastern front are the coal offices of MESSRS. WARD, TALBOT & OLYPHANT, and MESSRS. S. H. BROWN & Co.

THE MAIN ENTRANCE is 12 ft. wide and 19 ft. high, flanked by two elegant polished granite columns, with white Italian marble bases and capitals, which rest on stone corbels, bound in with the stone-work of the basement. The stone stairs are of solid blue stone, in one piece for each step, about 14 ft. long. The walls of the stairway are of Nova Scotia sandstone, laid up in courses, and the ceiling is vaulted in segmental arches of solid stone, ascending in courses of counterparting steps, at the same inclination as the stairs.

The offices of the Delaware and Hudson Canal Company occupy the entire westerly part of the building in the first story, a room 56x97 ft. This room has four square piers, with granite bases and capitals, connected by segmental arches supporting the ceiling. The offices are separated from each other by hard-wood partitions of a certain height. The office of the General Sales Agent is, however, separated from the public ante-room only by a low marble balustrade. The unique design which prevails throughout the whole structure has been carried out in every detail, even to every piece of furniture in this room; and, connected with the company's office by a graceful iron stairway, is a Record Room, containing the books, records, and other valuable papers of the Delaware and Hudson Canal Company.

The walls are finished in marble cement plastering of great durability and beauty the ceiling is tinted in light cream color with a handsome border.

COAL AND IRON EXCHANGE BUILDING, OWNED BY THE DELAWARE AND HUDSON CANAL COMPANY.



Dotted lines indicate partitions that can be put up.

Plan of Basement.

12 feet, and 13 feet 2 inches high.

The woodwork of the trimmings throughout the building from cellar to attic, is of white ash, finished in shellac and wax polish. The height of the first story is 19 feet in the clear; 2d story, 13½ feet; 3d, 4th, and 5th stories 13, 12½, and 12 feet respectively. These three floors contain each thirteen magnificent offices. Among those already occupied in room No. 61, we note the American Diamond Rock Boring Company.

Picture rods and chair rails are provided in all the rooms. The mantel-pieces are of gray American marble. Gas-fixtures of bronze.

Every room is heated by steam-pipes placed under the window sills, out of sight. The rooms are ventilated by drawing the air off through registers to a central ventilating shaft, surrounding the smoke pipe from the steam boilers.

The main stairway from the basement to the 6th story is made principally of wrought iron. The treads are of white Italian marble and slate. Two elevators, one at each side of the main staircase, convey the public, during business hours, to any of the upper floors.

The entire absence of any combustible materials in the construction of parts, and the avoidance of iron supports for either walls or floor-beams, makes this structure practically "fire-proof."

The floors are constructed of rolled iron beams, filled in with horizontal arches, either of hollow bricks, or hollow hydraulic lime of Teil concrete blocks, wedge-shaped and set together flat, so as to present a perfectly level ceiling. These arches are covered with a coat of French Lafarge cement, thus making the floors water-proof. On this incombustible foundation rest the yellow pine sleepers to which the flooring is nailed. In the halls, horse-shoe tiles and concrete form the foundation for the marble tiling which constitutes the hall floors. The partitions, where they are not solid brick walls, are laid up in hollow blocks of lime of Teil concrete, of sufficient thickness, without the use of any upright supports.

All the windows, front or rear, throughout

the building and the two entrances are provided with corrugated, self-rolling, steel shutters.

The roof of the building is constructed in the same manner as the various floors; and then it is covered with heavy sheet copper, laid down with standing joints, without the use of any soldering. The roof is thus rendered fire and water proof for an indefinite period of years. From the highest point on the roof, a magnificent view is obtained of the entire city of New York and its surroundings.

CEDAR RAPIDS (IOWA) WATER WORKS.

TO THE EDITOR: SIR—It may be of interest to your readers to give a description of the new Cedar Rapids (Iowa) Water Works, the fire-engines of which are just completed, and have been given a successful public test.

The water work's machinery plant consists of a horizontal compound duplex pumping engine, having a minimum capacity of a million and a half gallons of water per 24 hours, for domestic supply. The cylinders of these engines are respectively 48 in. and 26 in. diameter, by 30 in. stroke, each being connected to a pump 14 in. diameter by 30 in. stroke. A further detailed description of which will be given at a future time.

The fire-pumps consist of a pair of 16x24 inch steam-cylinders, placed immediately ahead of a pair of 10x24 pumps, the same piston rod connecting both steam and pump pistons. The two sets of engines and pumps lie side by side, and are connected to one main shaft by means of crossheads and connecting rods in the usual way, the cranks being set at right angles to each other. The front cylinder heads are elongated in housing frames, having the guides and pillow blocks cast in.

The engine valves are set with line and line exhaust, and of a proper length to enable pistons to travel full stroke with live steam. These are operated by a rock-shaft extending across both engines and driven by eccentrics on main shaft. The pump valves are of brass, on the double beat order, and consist of a small valve hinged on the back of a larger one, which also constitutes its seat, both operating together, act as one valve. The small valve opens in a contrary direction to the larger one.

The fine performance of these pumps is probably due, in a great measure, to a peculiar feature in the arrangement of the suction chamber, whereby the pump is primed each time the engine turns her center, thus insuring a full barrel for each stroke. This operation being obtained by elevating the suction-chamber *above* the barrel of the pump, thus enabling the water to fall by gravity, and raise the suction valves and discharge its contents into the pump at the terminus of each stroke. This arrangement of the suction-chamber is patented by the builders.

The compound and fire duplex engines lie side by side on massive foundations, capped with large slabs of dressed stone 12 inches thick, the corners of which are angled off for finish. Between the two sets of engines an 8-foot passage is provided for, at the head of which stands a boiler iron air-chamber 48 inches diameter by 12 feet high, resting upon a large cast iron cross. Into this cross both sets of pumps discharge the force water and thence into the street mains; the air-chamber is encased by a lagging of black walnut and cherry, capped and based by bold mouldings.

All the steam and water pipes are arranged below the floor, leaving nothing exposed to disfigure the general appearance of the engines. An independent boiler feeder is also conveniently placed, to which is attached a pump for supplying air to the air-chamber.

There are two tubular-boilers of sufficient capacity to drive both sets of machinery; they are 14 feet long, by 54 inches diameter. The grates are 5 feet wide by 5 feet deep. The back fire-wall is hollow, and provided with air-passages for burning the smoke, said passages being controlled by butterfly doors set in the front wall. The side walls are also built with a 3-inch air space, to prevent radiation of heat; iron bars extend across the top of the boilers supporting a brick roof, for the same purpose.

A public test of the fire-pumps took place lately, of which the following from the Cedar Rapids *Daily Republican* will give a full account.

The nozzles used were two of 1¼ inch diameter, two of 1⅛ inch, one 1⅛ inch, and one 1 inch. During the test the pressure as demonstrated by a gauge on the air-chamber was 90 pounds per square inch whilst the calculations showed 88·56 pounds—the boiler pressure was from 50 to 55 pounds to keep the streams 100 feet in height (as required by contract) varying but 2 pounds from calculated pressure. The revolutions per minute of fly-wheel exactly tallied with calculations. The boiler pressure was, during the trial, run up to 90 pounds per 9 inch as a *reserve*, the throttle now being full open as in the first instance. The result of the experiments were very satisfactory. Respectfully yours,

ALFRED E. WATKINS, Mechanical Engineer.

CONDITION OF MINING INDUSTRY IN UTAH.

Special Correspondence of the Engineering and Mining Journal.

LITTLE COTTONWOOD DISTRICT.

THE last month's snow storms have completely blockaded the roads during the greater portion of January, and, consequently, the ore shipments have not been so heavy as usual. The Flagstaff has shipped an average of forty-five tons a day; the South Star and Titus, about twelve tons; the Vallejo six, the North Star, eight; the Highland Chief, five; the Golconda, fifteen; the Ohio, five; the Gladiator, five; Iris about five; and the Spotted Tail is also producing a good quantity of high grade ore. The Grizzly is being put on a basis for spring work, and will then be able to handle the immense bodies of low grade ore standing in the mine. The Victoria and Imperial Tunnel Company's Works are lying idle at present, the tunnel being completed to a distance of about 1,000 feet, and having crossed several veins. The Bay City Tunnel is still working with closed doors. The work has already reached a distance of over 1,800 feet, and is said to have a large body of high grade ore some 1,700 feet "in" from the surface, but this is kept quiet for the present.

LITIGATION.

The South Star and Titus have brought suit against the Flagstaff Company laying damages at $1,000,000. The case is one of priority of title, the Titus having been located in 1867 and the Flagstaff in 1870. It is also a test of the right of a company to work outside of their patent lines.

BIG COTTONWOOD DISTRICT

is sending better ore and more of it than ever before. The Prince of Wales works about 125 men, and ships some of the best ore ever sent from the mine. The Highland Chief is also doing well, and has a good working force. The Reed and Benson employs about 20 men, and ships five to six tons daily. The Virginia is soon to start up on a vein similar to the Prince of Wales, which has been worked during the summer and shows about 1,000 tons of good ore in sight. The Evergreen has a large body of copper ore in sight and works a small force. The Richmond and Theresa has large bodies of high grade ore in the mine, but is tied up under an injunction.

IN AMERICAN FORK

the Miller Mine works a small force on ore, and the Wild Dutchman about 20 men. They take out about ten tons daily. The Sunday (gold mine) has been handed to New York parties for a good figure. It has a large vein of good gold and silver ore with about eight to ten per cent. of lead. The Pittsburg Mine is also idle, though there is about 10,000 tons of ore in sight in the mine. The ore will average 35 per cent. lead and 13 ounces silver to the ton. All the other mines in this district are at present idle, the cause being want of a market for the ores.

IN UINTAH OR PARLEY'S PARK DISTRICT

the Ontario stands at the head of all the mines, and produces about $14,000 a week in silver bullion. It is developed to a depth of over 600 feet, and is supplied with hoisting works and all improvements for first-class working. The Flagstaff mine works a small force, and the McHenry mine about 20 men. The weekly product of the district is about $20,000. The Walker and Webster, Piñon and other mines are waiting for the snow to settle to commence work again. On the whole, the prospects of the district are excellent for the coming season. The ores are chiefly "milling" ores, and are generally of high grade, milling in the vicinity of 100 ounces silver to the ton. There are two twenty-stamp mills in the district, which are kept pretty steadily at work.

THE ORE MARKET AT SANDY

for the ore of these districts is one of the best in the country, the selling price of ores being $1 15 to $1 25 per ounce for silver and 50c. per unit for the lead over 25 per cent, and 75 cents for every dollar of gold. The Saturn, Flagstaff and Germania smelters are kept pretty well supplied with ores from these districts, and the others generally try hard to obtain the Wasatch ores to mix with the ores from Bingham and other Western and Southern points. M.

SALT LAKE CITY, UTAH, February 2d, 1876.

LAKE COUNTY, COL.

Special Correspondence of the Engineering and Mining Journal.

IN this centennial year, which will also be our first year of Statehood, I know that much attention is given in the East to Colorado and its mineral wealth. I think, therefore, your suggestion, that the territorial assayers should use the columns of your influential journal for the purpose of making better known this young State, that to many in the older States is, I suppose, a kind of *Ultima Thule*, an excellent one.

As regards this country there is, probably, none in the Territory that has struggled against greater disadvantages. Foremost among these has been the want of smelting works. This want has caused numberless rich discoveries to remain unworked, simply because there was no market for the ore. Another disadvantage has been the want of capital to be employed in the mines. Hitherto, with only one exception, the work done in this district has been entirely the result of the untiring energy of our own hard-working miners. The only exception where a company has done anything, is the Boston and Philadelphia Gold and Silver Mining Company, owners of the famous Printer Boy Mine in this gulch.

The first excitement in this gulch broke out in 1860, since which time it has been roughly estimated, between four and five millions of dollars have been taken out of a gulch not over six miles long. Of course, the palmy days when a man with pick, shovel, and pan, could wash out a fortune, are past, but the gulch diggings will soon make a rich return for investment. It was but lately that one of our most enterprising gulch miners, ADOLPH DONATH, having purchased a claim already worked over, took from it a nugget worth $200. The Oro City Ditch and Fluming Co., composed of Eastern capitalists, and under the management of A. B. WOODS, Esq., having seen the certain advantages to be gained, have undertaken extensive works in the lower end of the gulch, with every prospect of gratifying success. In this, the upper end of the gulch, many of the old claims are still held by the original owners who work them steadily and with gratifying success. Foremost among these, I may place the claims of WELLS & MOYER, DONATH BROS., WALL & POWELL, H. A. W. TABORS, T. GRAHAM, LEAHY & DEMPSEY, ARNOLD & Co., GEORGE HENDERSON, T. STARR, and STREET & MONTGOMERY.

Passing from our gulch to our lode mines, the class which I have alluded to as suffering from so many disadvantages, I am happy to say that a better era is dawning for them. The long-felt want of an ore market, is being at length supplied. The Cincinnati Smelting Company under the efficient management of EMILE LOESCHER, Esq., has erected extensive works in the mouth of the gulch, a position commanding one of the richest mineral districts in the country; and the opening of Spring will see them in full blast. At Chalk Creek, forty miles south, works have also been erected by CHAPMAN & Co. These, too, form a center for a good district. Right in this camp, Captain S. D. BREESE is putting up chlorination works, which are much needed for our low grade ores.

Among our most noticeable lode mines is the Printer Boy, owned by the before-mentioned Boston and Philadelphia Gold and Silver Company, under the agency of Hon. I. M. PAUL, and the management of W. H. JAMES, Esq. This mine is estimated to have produced, since its discovery, over half a million of dollars. The Five-twenty lode, owned by the same Company, after lying idle for five years, has been leased by the PEARCE BROS., and under their energetic working, is making splendid returns. The Berry Tunnel, owned by Captain S. D. BREESE, is a splendid vein, 15 feet wide, which is being energetically worked with a large force. The American Flag, owned by J. J. HOOVER; the Lincoln, owned by D. PRINGLE; the Mike, owned by NORRIS, MOYER & Co.; the Grey Bird, owned by PAUL & DE MARY; the Lime Ledge, owned by A. B. WOODS; the Miner's Hope, owned by GORRIS & Co.; the Gray Eagle, owned by PEARCE, SMITHAM & Co.; the Great Eastern, owned by PEARCE BROS.; and the La Plata, owned by F. BRADSHAW & Co.; also the Hanky Panky, owned by GRAHAM & Co., are among the many paying mines that I now have time to mention, lying in this gulch. I should also have mentioned the Maria lode, owned by PEARCE, RISCHE & Co., and the Victor, owned by BERRY, DE MARY & Co.

In the Homestake district, about one hundred lodes have been discovered, the principal one being the Homestake, owned by Colonel ARCHER, of Denver. This mine will prove second to none in the Territory. Further down the valley many lodes have been discovered. I may name here, of these, the Income, owned by WM. MCDERMITH & Co.

It may be of interest to those of your readers, whose only ideas of a mining camp have been gathered from "Roughing It," to know, that here in Oro City, we have a first-class hotel, JOSEPH PEARCE, proprietor; a general store, where

every want and luxury can be supplied, owned by H. A. W. TABOR; an elegant billiard hall, WM. MCDERMITH, proprietor; a well-conducted saloon, GEORGE HAYES, proprietor; a commodious and elegant Oddfellows' hall, with a lodge numbering over 50 members; and further, that the morals of this camp have never required a calaboose to correct them. Add to this, that in the entire gulch there is not a single house of doubtful fame, and you will admit that we have reason to be proud of our camp.

In this, my first letter, I have, necessarily, generalized to a considerable extent, but I hope, in future, to give you more detailed descriptions. H.

ORO CITY, 27th Jan., 1876.

GRAND ISLAND DISTRICT, BOULDER COUNTY, COL.

Special Correspondence of the Engineering and Mining Journal.

IT will certainly be considered as very natural, that the contents of my first letter for your Journal will be some information about the mining district, in which I am at present most occupied. Grand Island Mining District may not be the oldest known of the existing districts of Boulder County; it is, however, the most important so far as the production is concerned.

The majority of the principal mines of the district are situated within a rather small circumference on the Caribou Hill, at a height of about 10,000 feet above sea level. Of these mines the Caribou is not only the center and most important, but also the most productive mine of Colorado. Its yield, in 1875, was $10,000 more than the Gregori Mine in Gilpin County, which produced $200,000, and $60,000 more than the well-known Dives and Pelican Mines in Clear Creek County, the production of which was estimated at $150,000 each. Still, the amount of $200,000 is far from what it could be made to yield, and what it must do in order to pay a reasonable dividend to the shareholders. One hundred and fifty feet west and 200 feet east from the main shaft is all that has been opened to the depth of 500 feet. On the remainder of the 1400-feet claim a few shafts were sunk to a small depth only, at distances of 500, 600, and 700 feet west from the main shaft. These shafts are connected by levels which, at least, proved that the vein on that part of the claim carries silver ores also, and the richness of the two chimneys of ore found in that part of the vein will, probably, prove in depth not inferior to the three chimneys or streaks of ore worked in the sides of the main shaft.

When, some twenty years ago, I made a journey through England and Belgium, at the expense of the Netherland Government, in order to obtain more practical knowledge about mining, it was my especial object to visit those mines which were known to be badly ventilated, or unsufficiently timbered, or badly managed, for it is impossible to observe in well-managed mines all the little details which it is very important to know in the practical development of mines.

The Caribou Mine offers a splendid opportunity to any one who desires to obtain her connection with the theory, the practical knowledge of mining operations also. There one gets a better idea of how a mine should *not* be developed and *not* be managed than in most mines, the operations managed, in reality, by a board of directors residing at a distance of more than 6,000 miles, and who seem always under the influence of an evil spirit, never gave satisfactory results, and the mine is now so deeply in debt that it will, probably, have to be sold to satisfy the creditors.

I intend to give you in one of my next letters a brief history of the Caribou Mine, for I consider it not only very instructive for future mining engineers, but also for capitalists, who are desirous of investing their money in mining enterprises, and who are aware of the fact that it is especially to the interest of Colorado that mining should not be a game of hazard any longer, but become as legitimate and safe a business as any other.

It being my aim to make you acquainted with the principal mines of Grand Island District, I will give you in this letter a description of the Caribou Hill in general, and later on a description of the different systems of veins, their value, and the future prospects of the mines. There are different roads by which the Caribou Hill can be reached from Denver, the capital of Colorado. From Denver to Boulder by rail, and from there by stage through the Boulder Cañon is the easiest and most beautiful. A little beyond the village of Middle Boulder—to which lately was given the inappropriate name of Nederland—where the chloridizing and amalgamating mill of the Caribou Mine is situated, we leave the Middle Boulder Creek and ascend in a northwesterly direction till we reach the little town of Caribou, twenty-two miles from Boulder. This little town is built (?) on the slope of the Idaho Hill and at the foot of the Caribou Hill. As we enter the cañon, while still in sight of Boulder City, we pass highly inclined beds of Jura limestone and Trias sandstone. Immediately beyond this comes a hard and, in general, fine-grained granitic gneiss, forming the mountain chain which incloses the Middle Boulder Creek and makes the cañon so picturesque. The rocks are sometimes less distinctly stratified and traversed in all directions by small quartz veins.

At eight miles from Boulder we pass the so-called *tellurium belt*, recognizable by the coarse-grained granite, carrying in general crystals of magnetic iron, especially at the dykes or courses of granulite intersecting the granite from north to south. Not long since, prospectors from the Sunshine and Magnolia Mining Camps—the one about five miles south, the other about the same distance north from the cañon, were seen digging, tunneling or sinking shafts, to discover or open tellurium gold and silver veins on the right and left of the cañon.

From this point the formation changes again into a granitic gneiss to a little below the falls of the North Boulder, which here unites with the Middle Boulder Creek, where pure gneiss is noticed. Five miles from Nederland, or eleven miles from Boulder, the granite occurs again, forming here and there separate standing rocks, some of them as much as 200 feet in height. The most prominent of these is the Castle rock.

There small veins have been discovered carrying silver ores, although mostly of low grades and of little value.

From the village of Nederland we note the frequent alternations of hard, solid granite and gneiss, forming thin layers; the latter, sometimes, contains so much mica, that samples might pass for mica slate. Both formations are here and there intersected by mineral veins, and abandoned shafts can be seen on either side of the road.

In the town of Caribou, the change of gneiss and granite is very distinct. The houses on the north side of the main street are built upon gneiss, and those on the south and west side on and between blocks of granite. In ascending from there, the rather steep Caribou Hill, we pass an iron belt running nearly north and south, at about 1,000 feet from the town. This belt consists mostly of magnetic iron and can be followed for several miles in length, while it can be observed that it has cut off or bent several veins.

About 1,000 feet west from this belt, although not quite on the highest part of the hill, we come to a more level part, from which we have an extensive view—to the east over a great many hills, and to the north a little park, where the North Boulder Creek has its source. All around we see shaft-houses of different dimensions, and some at only a few feet distance from each other. The longer sides of those houses will soon be observed to have three marked directions; the greatest number are built east and west, others north-east and south-west and others again east-north-east and west-south-west—the longer side of the shaft-houses, following the directions of the veins on which the shafts have been sunk, indicate, thus, three systems of veins occurring in the Caribou Hill.

In another letter I propose to give some particulars of the characteristics and value of those veins. Within a few weeks, the number of mining camps in Colorado has been increased by one, and this in a part which had been considered, till recently, as "barren of mineral wealth," the environs of the well-known watering-place, Manitou, near Colorado City, in El Paso County, above the capital of the State.

Last summer, already, there was thought to have been found there that peculiar bluish quartz that always accompanies the tellurium ores—but then all efforts to discover veins seemed to have been in vain.

The manager of the Colorado Springs Mining Agency has recently written me saying: "We do not yet know how our gold discoveries will end. The gold-bearing rock is a deposit overlying granite, and about 75 feet in thickness and carries gold the full thickness (!) of the ledge. The only question to be solved is as to quantity. The average of about 100 assays show about six dollars to the ton; the gold is free." V. D.

THE FRYER PROCESS.

TO THE EDITOR: SIR—In your editorial of January 15th, on the Fryer Process, with the general drift of which I cannot but agree, you recur several times to the high temperature which Mr. FRYER uses in roasting, objecting to it, as I understand you, *in toto*, as far as solid auriferous iron pyrites is concerned.

It is true, that in ordinary roasting of solid iron pyrites for smelting purposes, a high temperature is emphatically not wanted, because the charge, instead of roasting, would melt. In that state no further elimination of sulphur would be possible. But in roasting the same material for chlorination, although up to the last period of the process a low temperature must be maintained, it is necessary to raise at the close the heat to a bright red, in order to expel the last remaining sulphur.

Partly for the same reason, and partly for another which I shall presently mention, I can very well understand why Mr. FRYER wants a high temperature. This is, that at the end of his roasting process, when he has eliminated nearly all the sulphur (as much as is possible in a kiln), he probably wants to raise the temperature sufficiently to *melt* the gold in the ore. If the ore had been solid iron pyrites (with, say, 10 to 20 per cent. of silica,) it would, under the conditions maintained in his furnace (presence of carbon and carbonic oxide), of course melt also; but there is no objection to that, except the higher cost of crushing for subsequent treatment. If, on the other hand, the ore had been the common California gold quartz, which contains from 1 to perhaps 20 per cent. of iron pyrites, the ore, as a mass, would remain unmelted, but a very stiff slag would be formed by the strings of protoxide of iron and the contiguous quartz sintering the mass, perhaps, while the gold would also be melted. But in either case the gold would be present in small, invisible globules, scattered through the ore; and in crushing and amalgamating this, the gold would present itself to the mercury in a bright state, so that there would be no difficulty in extracting the metal, so far as mechanical difficulties and losses permit.

In making this suggestion, I do not wish it to be understood that I think the Fryer patent kiln necessary, or even desirable, to obtain the results indicated. On the contrary, it seems to me open to grave objections, the principal ones being that it is unnecessarily costly in its construction, that it is not continuous in its operation, and that, on account of the unnecessary water cooling, it opens the way for a very large waste of fuel. METALLURGIST.

The suggestion of "Metallurgist" is reasonable. But, as we understand it, Mr. FRYER maintains a high temperature nearly throughout his roasting process, and the conditions will, therefore, be materially different from those assumed by our correspondent. ED.

COAL RECEIPTS IN ST. LOUIS FOR 1875.—The comparative receipts, by railroad and otherwise, were, according to *Mines, Metals and Arts*, as follows:

Received by—	1875. Bushels.	1874. Bushels.
Ohio & Mississippi RR.	4,015,675	4,034,750
Belleville & Southern Illinois RR.	8,768,911	7,777,625
St. L. & South Eastern RR.	4,457,069	4,039,782
Illinois & St. Louis RR.	5,115,618	4,923,928
Vandalia RR.	4,775,312	3,037,120
Cairo & St. Louis RR.	2,679,122	1,405,500
Toledo, Wabash & W. RR.	456,250	52,500
Chicago & Alton RR.	44,500	162,500
St. L. & Iron Mountain RR.	24,888	43,880
Indianapolis & St. L. RR.	319,400	922,000
From Ohio River	1,328,000	1,410,375
From Grand Tower	47,250	698,250
From Illinois River	.....	33,000
From St. Louis County	1,000,000	1,600,000
Other sources	.....	103,600
Total	28,617,995	29,944,700

PENNSYLVANIA LEGISLATION ON THE SETTLEMENT OF LABOR DISPUTES.—Several bills have been reported favorably in the Pennsylvania State Senate bearing on troubles in the coal regions. One provides for the appointment of a joint special committee to investigate the causes of disputes between employer and employed in the coal business of the State, and to suggest legislation, if they can, for the speedy adjustment of the disputes. Another bill prescribes how the employees of persons, partnerships, associations and corporations engaged in the mining of coal or the manufacture or production of iron and steel, shall be paid for their labor and services. Senate bill, No. 54, is an act for promoting the qualifications of engineers of stationary engines and securing the safety of persons employed in and about the anthracite coal regions.—Minersville *Republican*.

THE COST OF PRESERVING ORDER IN THE ANTHRACITE REGIONS OF PENNSYLVANIA.—It cost the State of Pennsylvania $106,743.44 to maintain the military in the anthracite coal regions in April, May, and June of last year. Their presence, it will be remembered, was necessary to suppress the lawless acts of the miners on strike. If the local authorities were held responsible for all damage done to persons or property by mobs of strikers, there would be more energy shown in putting a stop to such proceedings and no need of the military as in this case.

STRAINS IN TRUSSES.

TO THE EDITOR: SIR—In your issue of the 8th ult., is an interesting article on the Strains in Truss Bridges, written by JOHN C. TRAUTWINE. In that article Mr. TRAUTWINE brings forward some difficult points, and asks some pertinent questions in regard to the strains in special forms of trusses.

Below I reproduce the figures made use of in the article mentioned, with such additional lines drawn upon them as are necessary to the explanations which are to follow.

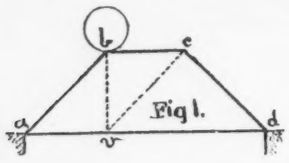


Fig 1.

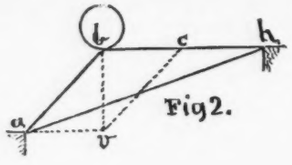


Fig 2.

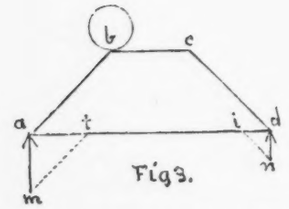


Fig 3.

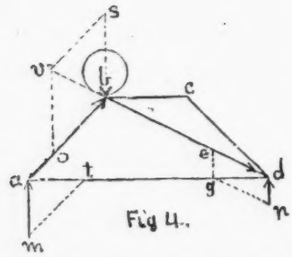


Fig 4.

It will be convenient to consider Fig. 4 first, as the questions referring to the other figures will then be, I think, easily disposed of.

Mr. TRAUTWINE asks: Can any of your readers tell us the actual amounts of the strains on the Truss, Fig. 4, with the strut *bd* omitted; also the process for finding them?

I suggest the following solution: Join *bd*, and construct the parallelogram *bovf*, on *bv*, as a diagonal representing the weight. We have *bo* representing the strain along the brace *bu*, and *bf* representing the force in the direction *bd*, which must be transmitted through *be* and *cd*. *be* is the portion of the load sustained at *a*, and *bh=ev* that sustained at *d*; *oe=hf=bk* is the strain in the pin *ad*. Make *dn'=bh*, and complete the figure as represented; then *dp* represents the longitudinal strain in *de* and *n'p* is the horizontal component of that strain; but *n'e=hf*=the horizontal force transferred through *eb* and *cd*, to the abutment *d*. Therefore *pe=n'e—n'p*=the *shear* in *de*.

The existence and amount of this latter strain is rendered apparent by taking into view the extreme cases. If *e* coincides with *b*, the horizontal component of *de*, which is equal to *dg*, is sufficient to resist the component *bk* in *be*, and therefore no cross strain is brought upon *de*. Secondly, suppose *e* at *C* at the right of *b* and over *d*. In this case *de* or *dC* has no horizontal component, and therefore the horizontal force *bk* is transferred to the abutment *d* by means of shear in *dC*. When *e* is between *b* and *C*, the shear is as given above.

The joints are, of course, supposed to be rigid. I think we are now prepared to believe that: "No matter how stiff and unyielding the joints of Figs. 1 and 3 may be made, the load at *b* will not produce either the strains *cb* and *be* indicated by the parallelogram of forces, nor those *tu* and *di* indicated by the principle of the lever." The parallelogram of forces, however, gives *bo* and *bk* for the strains in *ba* and *bc*, and the same *with* the principle of the lever gives *at=de* for the strain in *ad*.

In the case represented in Fig. 2, the supports being at *a* and *h*, the writer stated that: "Here the parallelogram of forces gives us precisely the same strains *ba* and *bc* as before, but this time correctly, for all the weight of *b* will now actually rest on *a*." In regard to this, it is sufficient to say, that the respective portions of the load carried at the abutments, are found as in the other figures. It is, of course, from an oversight that all of the load *b*, was supposed to rest upon *a*. I see no difficulty in applying the parallelogram of forces to the other cases mentioned.

P. H. PHILBRICK.

IOWA STATE UNIVERSITY, January 31, 1876.

THE PRODUCTION AND CONSUMPTION OF LEAD.

THE following review of the Lead market is communicated by EDWARD A. CASWELL, metal broker of this city. Mr. CASWELL has opportunity for knowing the actual and prospective condition of the trade; his remarks, therefore, are of great practical value and interest:

The lead business of the country must have been at least five per cent. less than in 1874, and as the normal increase with the growth of any people is usually from five to ten per cent. annually, the diminution should in reality be calculated as being from ten to twelve per cent. The *supply* for the year has been about five per cent. less than last year, so that the decrease in consumption has just counterbalanced the decrease in supply. Our United States *production*, however, has increased 6,500 tons, being from 46,500 to 53,000 long tons, or fourteen per cent. The decrease in supply has come from reduction in importations and Government sales.

During the first three months of the year the outlook for an increased production was extremely promising, both Missouri and the Far West had up to that date, run far ahead of the average in 1874. During April, May, and June, however, one refining company and one of the largest smelting firms in Utah stopped working, another Smelting establishment was burned down, one of the best Utah mines became crippled, the extensive Selby Smelting works closed, and the financial troubles in San Francisco seriously checked the California production of bullion. All these drawbacks tended to counterbalance the increased production of the early part of the year, and during the last three months only has the deficit been made up, and our capability of production recovered lost ground, standing now just about where it did a year ago.

During the year the Richmond M. & S. Co., at considerable outlay, have erected desilverizing works of large capacity, including furnaces for making a corroding brand. This is the first example of any Far Western Mining Co., refining its ore at the mines, and eventually two advantages will be gained by this step, considerable saving will be made in freight and commissions, and the uniformity in the ore treated will overcome one of the greatest drawbacks hitherto experienced in producing selected lead.

The St. Louis S. & R. Co. are pushing their business with renewed vigor, and are producing a refined brand of excellent quality. The only question for them, as for the other selected lead refiners, is to purchase an ample supply of suitable bullion at fair rates without thereby raising the market price on themselves above paying limits.

There are at present in the country seventeen desilverizing works, and the fact that only nine of them are in active operation, tells its own story. Two are turning out only selected lead, three others are making both selected and ordinary brands, and the remainder ordinary brands only. Refiners claim that four thousand tons per annum is required as the minimum quantity for economical and renumerative working, and if this be so, our production of argentiferous bullion (at present about 32,000 tons,) can support only eight establishments, which the practical results above mentioned seem to demonstrate.

The Joplin and Granby districts and Palmer mines have increased this year, and are in a better position than ever before to develop their resources. The La Motte mines passed into new hands last March, and have since then doubled their output under the systematic and active management of their present owner, who also contemplates the erection of furnaces to produce a selected lead. The St. Joseph mines, under the present efficient direction, have increased twenty-five per cent. The Mexican mines have been placed under new superintendence, and their owners hope to ship in larger quantities than heretofore. About 500 tons have reached our market from this source in 1875. The Rossie mines in this State were worked for a short time, but it was found that the cost of production was more than could be realized by the sale of the lead, and their development was abandoned, while the Newburyport Bonanza has apparently passed out of existence to a tune in short metre.

The United States Government has still for sale about 1,500 tons of foreign lead, which is being slowly absorbed at their asking price, 6¼c. gold. This stock is now so small and the price so high, that it can have but little influence on the market.

The European market has been of little interest to us except in so far as the price of refined, selected lead approached the price of soft Missouri and our own refined brands. Common foreign has only been sold for re-export in manufactured shape, and for some few special purposes. It would seem that the withdrawal of an export trade from Europe of twenty-five thousand tons annually should cause a decline in prices, but the contrary has been the case, owing partly to the troubles in Spain and still more to the increased European demand for manufactures and also for war purposes.

It must be noted that while our United States supply has varied for three years past, our production has shown such steady and uniform increse in the face of all drawbacks as to demonstrate our ultimate entire dependence on domestic lead *beyond all question*.

On the other hand, we must not be too sanguine, for this end will probably be reached through many reverses and after many trials. The lead interests of the country are passing through a period of experiment and transition, and however certain the *final* results may be, no man can foretell *how soon* they will be attained, for we cannot overlook the facts that prices always govern, that the tariff is an arbitrary restriction on the natural laws of trade, and may, any day, be removed, that the premium on gold is a variable factor, and seems likely soon to disappear, and that the European market may decline to a parity with our own prices. But whatever effect the shifting influences of time may have on the question, the following points are certain:

1st. *The refinement of domestic ore for corroding brands is equivalent to the withdrawal of just so much supply of common lead.* Five selected brands are now in the market, and the makers expect to do a largely increased business next year. The quantity of extra refined desilverized lead turned out by them in 1875 may be put down at 6,500 tons, the larger portion of it during the past six months, and the effect of this on common lead has been to reduce the stocks on hand to an extremely low ebb throughout the country.

2d. *The price of selected foreign brands and extra refined American brands must approach one another.* The price of American selected leads has advanced steadily for the past six months, until it has now reached 7¾c. currency, laid down in N. Y., while the price of fine European brands equal about 8¾c. currency, so that a fall of three points in gold here and one pound per ton for lead in Europe would bring the two leads into direct competition.

3d. *The prices of ordinary and refined domestic leads must approach each other to within one-half a cent per pound and fluctuate simultaneously at about that difference.* This result, however, will not be attained until the selected brands have all reached a still higher standard, are on a firmer basis, and have come into use to the entire exclusion of foreign through a plentiful supply of home ore, but the tendency is already evident.

The figures relating to the consumption of lead by corroders East and West, given below, are somewhat less than and at variance with popular estimates. They have been obtained, however, by subtracting the *actual* railroad receipts in the seaboard cities from the *total* supplies, and must be very near the exact truth, being also verified by the individual statements of numerous refiners and consumers.

In considering these figures, it should be borne in mind that corroders take up several thousand tons of ordinary lead per annum for the manufacture of red lead, litharge, etc., so that their consumption represents more than the actual demand for white lead.

Distribution of supply East and West:

For Corroders.		Shot, Sheet, Pipe and Trade.			
EAST.	WEST.	EAST.	WEST.	CALIFORNIA.	TOTAL.
18,790	15,000	16,883	8,300	2,500	61,473 gro. tons.

The East includes all the Atlantic seaboard cities, and the West includes St. Louis, Pittsburgh and intermediate cities.

Stocks throughout the country have been reduced about 3,000 tons, thus making the total consumption 64,473 gross tons, against 68,500 in 1874.

MOVEMENTS OF LEAD IN NEW YORK CITY.

	1873.	1874.	1875.
Imported	15,512	11,763	4,900
Government sales	2,400	4,125	915
Desilverized	6 100	5,500	8,500
Western receipts	2,150	2,316	4,858
California	2,900	6,029	5,277
Gross tons	29,062	29,783	24,451

Stocks in 1st hands in New York City, January 1st, 1875, about 4,000 gross tons.
" " " " 1876, " 1,500 "

In regard to the future it only can be said that, if we produce even one-half what the mines promise, we shall have an ample supply, and the country will celebrate its Centennial year by becoming entirely self-dependent as to lead.

MISSOURI'S PRODUCTION OF ZINC ORES FOR 1875.

THE Missouri mines yield three ores of zinc: blende, silicate and carbonate. The blende is most largely mined in Jasper and Newton Counties. In Jasper and Newton the silicate is next in quantity, while the carbonates are as yet mostly worked in Dade County and Southeast Missouri.

The following table is nearly correct as to the total production of zinc ore in 1875:

Counties.	Blende.	Silicate.	Carbonate.
Dade.....tons		2,500	4,000
Newton.....	2,500	6,500	
Jasper.....	4,000		4,500
	6,500	9,000	8,500

Total 24,000 tons.

There is an enormous quantity of ore to be obtained from recently developed mines. The following proportion of the year's yield was used by St. Louis smelters *

	Tons per month.	
Martindale Zinc Co.....	500	silicate and carbonate.
" "	150	of blende.
Missouri Zinc Co.....	350	of carbonate.
Carondolet Zinc Works.....	250	"

1,250 or 15,000 tons per annum.

Of which 1,800 tons were of blende, leaving 4,600 tons of blende and 4,300 tons of silicate and Carbonate for the following smelters:

Washington Furnace, exclusively Washington carbonate; Cherokee, Kansas Zinc Works exclusively ores from Dade; PAGE & KRAUSE, St. Louis, carbonate;

ZINC OXIDE.—MATTHIESON & HEGELER, La Salle, Ill., blende and carbonate. La Salle Zinc Co., La Salle, Ill., carbonate; Illinois Zinc Co., Peru, Ill., blende, silicate and carbonate; Lehigh Zinc Co., Pennsylvania, silicate.

Notwithstanding Illinois and Pennsylvania smelters are supplied to some extent from home mines, they are, nevertheless, ready purchasers of large quantities of Missouri zinc ores, and actually maintain permanent local agencies for their purchase. This circumstance is an admission of the superiority of the Southwestern zinc ores, as well as their greater economy.

The blende produced in Newton and Jasper is bought amidst sharp competition by MATTHIESON & HEGELER, the Martindale and the Cherokee Zinc Companies. Average price at the mines, $14@$15.

SILICATE, CARBONATE.—The St. Louis Furnace Companies, Illinois Companies, and the Lehigh, have paid from $10@$12 for silicate, and $12@$15 for carbonate delivered at the A. & P. RR., or equivalent price at the mine.

SOUTHWEST MISSOURI ZINC PRODUCTION.

The past year has been a prosperous one for Jasper County, as far as the zinc production is involved.

The following firms shipped the following quantities of zinc ore:

	Tons of Zinc.
Chicago Z. & M. Co.....	7,600
Matthiesson & Hegeler.....	7,000
Mineral Point Zinc Co.....	6,000
Martindale & Eddy.....	1,000
Peru Zinc Co.....	1,500
Total.....	23,100
Total cash value.....	$300,000

The above quantity of zinc, shipped in 1875, is nearly double the production of the year 1874, while the price has averaged $12 for blende and $18 for silicate, making a total money value of $300,000.—*Mines, Metals and Arts.*

PRICE'S RETORT FURNACE.

THE following communication from Mr. SIEMENS, to *Engineering*, will be read with interest:

SIR:—In a paper read by Mr. BELL before the Iron and Steel Institute, describing PRICE'S patent retort furnace, and which you publish in your issue of the 8th October, (see ENGINEERING AND MINING JOURNAL, February 12th,) allusion is made to the SIEMENS furnace, and I shall be obliged by your allowing me to say a few words in reply. It is stated, "The preliminary conversion, however, of the coal into a gas is attended with a certain amount of loss, inasmuch as the whole of the fixed carbon is burnt to the condition of carbonic oxide, which means a sacrifice of about 30 per cent. of its heating power." This would be perfectly true if solid carbon were employed without decomposition of water, but as common coal is the fuel burnt, the actual results are different. In the gas producer three operations are performed: in the lower portion the fuel is burnt, and this may be called the zone of combustion; higher up the carbonic acid takes up a further equivalent of carbon, becoming carbonic oxide, this may be called the zone of carbonization; whilst at the uppermost layer of the producer hydrocarbons are produced in what may be called the zone of distillation. The temperature of the first zone would be about 2,400 deg. C., and that of the second about 960 deg. C., provided no water was admitted with the air for combustion. The mixture of carbonic oxide and nitrogen resulting from this reaction, and at the temperature of 960 deg. C., has still all the work to do, which is accomplished in a gas retort, namely, to deprive the coal of its hydrocarbons and vaporous constituents, amounting to from 30 to 35 per cent. of the weight of fuel supplied; the work done in this third or uppermost zone of the gas producer may be valued at 300 heat units per pound of fuel charged,* which would deprive the hot gases of 270 deg. C. of temperature, reducing that temperature to 690 deg. In practice I find that the temperature of the gas producer chamber does not exceed 400 deg. C., the difference being due to further useful work performed by the heat resulting from the first operation, namely, in the decomposition of water introduced below the grate in a pool, into which the hot clinkers falling generate steam, and which must be delivered in the proportion of at least .007 lb. per pound of fuel, or 6 lb. per ton. It is therefore evident that the loss of heat caused in converting the fuel to the gaseous condition amounts only to 12½ per cent. of the total quantity in the fuel, and this even is turned to useful account by causing an onward pressure towards the furnace, in the passage of the gas through the cooling syphon, thus avoiding the necessity of an artificial blowing apparatus, and a closed grate, which would be sources of considerable inconvenience in practice.

As against this small theoretical loss must be set the advantages of perfect combustion in the furnace, into which gas and air are admitted through valves in proper proportions, and the further main advantage resulting from the application of the regenerators, which I need not here particularize.

The unfavorable estimate which Mr. BELL has formed of the working condition of the gas producer has betrayed him into under-estimating the practical saving realized by the adoption of the regenerative gas furnace. The amount of this saving depends in a great measure upon the temperature at which the work in the furnace is being accomplished, the economy increasing with the degree of that temperature. Thus in melting mild steel in crucibles, an operation requiring intense heat, about 3 tons of Durham coke is required in the old process per ton of steel melted, which work is accomplished in the regenerative gas furnace with a consumption not exceeding 25 cwt. of ordinary coal. In carrying out such operations as the melting of glass and the reheating and puddling of iron, great saving has also been effected, but one of the largest applications of the system has been made to the reheating of Bessemer steel, requiring, as is well known, less intense heat than is required for the heating of glass and iron, and with reference to this application I cannot do better than quote from Mr. J. J. SMITH'S paper, read before the Iron and Steel Institute, on the 22d September, 1869, in which he says, "The results at the Barrow Works, taken over a period of two years, show 44 per cent. (saving), but the comparison is taken with furnaces built expressly to consume the hardest and best coal which could be procured, and notwithstanding the known loss previously mentioned in forcing the producers; but as the quality of the coal used was inferior, and very much less in price, the actual money-saving has been more than one-half."

It would be as well to look these facts fairly in the face before proceeding too far in the prosecution of new projects involving, perhaps, unnecessary expenditure of time and money.

Yours, faithfully,

C. WILLIAM SIEMENS.

* In practice it takes 4.5 cwt. to distil the gases from one ton of coal.

MINING LEGISLATION IN COLORADO.

THE following are the suggestions contained in a report made to the Constitutional Convention of Colorado by a committee appointed to indicate the subjects proper to be embodied in the laws of the State. Many of these suggestions are of wider application than the State of Colorado. Sections 6, 7, and 8, for example, might be transplanted into the legislation of Pennsylvania with great advantage:

MINES AND MINING.

SECTION 1. There shall be established and maintained the office of State Geologist, who shall be *ex-officio* Commissioner of Mines; whose duties shall be prescribed by the General Assembly.

SEC. 2. The Governor shall, with the advice and consent of the State Senate, appoint a person who is known to be competent, for State Geologist, who shall hold his office for a term of four years, unless sooner removed by the Governor for cause.

SEC. 3. The General Assembly shall fix the salary and prescribe the duties of the State Geologist, provide for the time and manner in which he shall make his report, and provide generally for the wants of that office.

SEC. 4. The General Assembly shall pass such laws as may be necessasy for the protection of operative miners, by providing for proper ventilation of mines whenever the same may be required, as well as for the construction of escapement shafts, or other appliances, as may be necessary to secure safety to the workmen in a mine.

SEC. 5. The General Assembly shall provide by law for such appliances and regulations in mines being worked, as may be necessary to protect the health of the operatives. The employment of children in the mines under twelve years of age is prohibited.

SEC. 6. The General Assembly may make such regulations from time to time as may be necessary for the proper and equitable drainage of mines.

SEC. 7. The General Assembly shall provide by law for an equitable assessment of benefits in favor of mine owners and operators, whenever by works and expenditures in mines, by draining, tunneling or otherwise, they produce results which inure directly or indirectly to the benefit or advantage of any contiguous or adjoining mine or mines, and whether any mine is benefited by such draining, tunneling or otherwise, shall be a question of fact to be determined by a jury.

SEC. 8. The General Assembly may provide that the science of mining and metallurgy be taught in one or more of the institutions of learning under the patronage of the State.

SEC. 9. No tax shall be imposed on any mining claim, or possessory right thereto, which during the year preceding the time of making the assessment has not produced an amount of ore sufficient to pay the expenses of mining for that year.

SEC. 10. All mineral-bearing veins, the title to which is vested by fee in the claimant, shall be assessable for general purposes of taxation upon the net product of the mine for the year in which such assessment is made. Said tax shall be assessed and collected as all other taxes.

SEC. 11. The ground for which a Receiver's certificate of entry has been issued and the improvements thereon situate, shall pay tax in proportion to their cash valuation, without regard to the value of the mineral vein or veins.

SEC. 12. The General Assembly may provide by law for the establishing of courts of arbitration, which shall have full power to hear and determine matters in controversy between litigants as to the possessory rights of parties. In no case during the pendency of a suit in law or equity, in any of the courts of this State, shall the operation or working of a mine be interfered with to the extent of depreciating its value.

WHITE LEAD.—The essential features of the invention of Mr. L. BRUMLEU, of Newcastle-on-Tyne, consist in firstly effecting the division of the lead to be converted into white lead and then subjecting the same contained in a suitably arranged chamber to the action either of acetic acid or of acetate of lead or of mixtures of the same, and also to the action of air and of carbonic acid; the chamber or chambers being so constructed that a rocking motion may be given to them in order that the white lead formed upon the surface of the lead may be removed by the action of the solution contained therein, and a fresh surface be thereby exposed.

MINING IN FRANCE.

A GREAT deal of interesting information about mining in France is contained in M. CAILLAUX's "Memoires sur les Mines Metalliques de la France, 1872," and "Tableau General et Description des Mines Metalliques et des Combustibles Mineraux de la France, 1875." The Gauls, CÆSAR tells us, were clever miners; the mediæval French succeeded very well in mining; but, as soon as France adopted the system of over-government, from which in all revolutions she has never been able to free herself, the mines began to languish. The Grand Master and Administrative Council (both dating from Henry II.'s reign) were too much for them. Thus mining had flourished in the Vosges till the mining districts were annexed by Louis XIV.; it had flourished in Franche-Comte under the Spaniards, but gradually died out when Franche-Comte became French. In the department of the Gard one can still trace JACQUES CŒUR'S workings; and the mines of the Limousin and Auvergne, and above all of Rouergne (the department of Aveyron), paid well till the religious wars, at the close of which all France came under the yoke of absolutism. The French mines of copper, tin, calamine, etc., are by no means worked out, says M. CAILLAUX; vigor and improvements in working are alone needed to make them thrive as of old. The Breton tin mines, for instance (to say nothing of those in Limousin, so famous in Celtic times), would, he thinks, succeed as well as those of Cornwall if proper methods of stamping and washing were employed. Unless they were to succeed better than most of the Cornish mines are doing just now, it would hardly be worth while to introduce the circular washing tables and other appliances which the Cornish managers brought in not many years ago from Russia. Tin will never pay again unless either the Australian supply ceases, or a great deal of the work now done by the miner can be done by machinery. Cornwall and Brittany are inhabited by much the same race; that the former has so greatly distanced the latter in mining is because in Cornwall private enterprise has been free; in Brittany it has been wofully trammeled; and, again, as a consequence of this freedom, English capital has always been pouring into Cornwall, while till the other day Brittany was cut off from the rest of France. We do not think, with all deference to M. CAILLAUX'S special knowledge, that the old French duchy will ever be able to make up its leeway. But, if a great deal of French mining is almost dead, iron-working is more active than ever, though, owing partly to the subdivision of property which destroyed the connection between the seignorial forests and the blast furnaces, and partly to the use of coal for smelting, the mode of production is completely changed. The little smelting-houses which abounded wherever rich ore was to be found have been to a great extent killed out as completely as in the old "blast-houses" on the Cornish moors; while great works like those at Creuzot have vastly increased. These are mostly situated on coalfields, and other ores, if still worked, are taken to them, just as the Northamptonshire iron earth is taken to the Black Country. In 1835, all the French iron-works employed 22,600 horse-power; in 1869, they employed 76,300, of which steam produced nearly 48,000. M. CAILLAUX notes with much pleasure a reaction which has quite lately set in, in Savoy and other well-wooded districts in favor of small works for making, not iron, but steel. He remarks that while in the last forty years the production of cast and wrought iron in France has increased five-fold, that of steel has increased twenty-fold. The yield of coal from French mines is 17½ millions of tons—twenty times what it was sixty years ago. It has doubled in 12½ years; while that of England, says M. CAILLAUX, takes fifteen years, and that of Belgium twenty years to double. In this way the proportion of imported coal has been reduced from two-fifths to a third. A greater output, combined with fresh "concessions," would (our author thinks) permanently lessen even this reduced proportion. The French coalfields are larger than many of us think; that which belongs to the Belgian field has been traced, under more recent formations, all the way from Lillers in the Pas-de-Calais to Condé in Calvados. M. CAILLAUX thinks that very generally the superincumbent strata are not too thick to be pierced to good purpose. No mine in this field exceeds 300 meters; this depth might (he says) be doubled with advantage. With their coal and iron, then, the French may fairly be satisfied; they had the steam-hammer at Creuzot before we in England had begun to use it, and M. SCHNEIDER, we know, built a good many locomotives for English railways. The other mines seem, as we said, choked with officialism; M. CAILLAUX hints that it would be as well to try a change, and to let the ownership of the metaliferous mines go along with that of the soil, reserving the present system for the working of coal mines. He thinks that France has a great future before her as a mining country, if only she can set to work untrammelled. But surely that is of all things the one which it is hopeless to expect.—*Pall Mall Gazette.*

N THE OCCURRENCE OF GALENA IN THE CARBONIFEROUS ROCKS AND PLANTS OF NOVA SCOTIA.

By HENRY S. POOLE, F.G.S., Government Inspector of Mines, etc.

IN the collection of minerals to be sent to the Centennial Exhibition, from Nova Scotia, there is a specimen of lead ore which shows that the mineral has infiltrated the tissue of some reed-like plant of the Carboniferous age. It is from the surface soil near Arisaig Pier. No pieces have yet been found *in situ*. Associated with the fragments discovered are others mineralized by iron pyrites somewhat similar to those found in the shaly portions of coal seams. Galena is known in other parts of the world to appear in coal, but, as far as the writer knows, never before as a mineralizing agent of vegetable structure. A further interesting discovery of galena was made at Port Hood, Cape Breton, where a small vein of calcite, containing massive crystals of galena, was found in the sandstones lying between two seams of coal, but no specimens similar to those of Arasaig were found. As they are possibly new, and consequently of interest, this notice has been submitted at the suggestion of Mr. TRAUTWINE.

Whether new or not, such specimens are of some value as confirming the theory of the aqueous origin of some mineral veins, for although the blast furnace has proved that galena can be volatilized by heat and re-chrystallized on cooling, the finding of galena in places where it could not possibly have been exposed to a high temperature requires some other agent than heat to account for its aggregation and deposition, and suggests the universal medium of solution, water, as the agent.

THE NUMBER OF BESSEMER STEEL WORKS IN THE WORLD.—Great Britain has now 21 Bessemer steel works, with 105 converters; Prussia, 14, with 61 converters; Austria, 12, with 30 converters; Bavaria, 2, with 4 converters; Saxony, 1, with 4 converters; Alsace, 1, with 2 converters; France, 8, with 25 converters; and the United States, 10, with 20 converters. These totals make up an aggregate of 71 works, with 251 converters, representing an annual productive power of 2,500,000 tons.

QUICKSILVER MINES OF CALIFORNIA.

From the "Commercial Herald."

Concluded from Page 157.

NEW QUICKSILVER FURNACE.

We have received from J. B. RANDOL, superintendent of the New Almaden Mine, an interesting table showing the work of a new continuous Quicksilver furnace, running since the 4th of March last at that mine in Santa Clara County.

	Pounds of ore roasted.	Flasks produced. Free.	Soot.	Total.	Per-centage.	Cords Wood burned.	Charcoal and Coke burned. Pounds.
March	501,800	449	21	470	7·17	19¼	5,866
April	576,000	503	23	526	6·98	20¾	8,640
May	595,200	738	29	767	6·85	22	8,928
June	576,000	713	31	744	9·88	20⅞	8,640
July	793,600	810	52	862	8·31	24½	11,904
August	608,000	658	41	699	8·78	22½	9,120
September	576,000	744	23	767	10·18	22¼	8,640
October	595,200	862	29	891	11·45	25	8,928
November	576,000	1,066	46	1,112	14·76	24½	8,640

This, says Mr. RANDOL, under date of January 6th, is an improved continuous furnace; commenced work in March and has since continued in successful operation. Of the November product it gave 1,112 flasks. A continuous furnace for working fine ores as they come from the mine, without making them into adobes, was completed and started in December. It promises to work successfully. Following is the Quicksilver production in flasks of 76½ lb. each at the New Almaden for the year 1875:

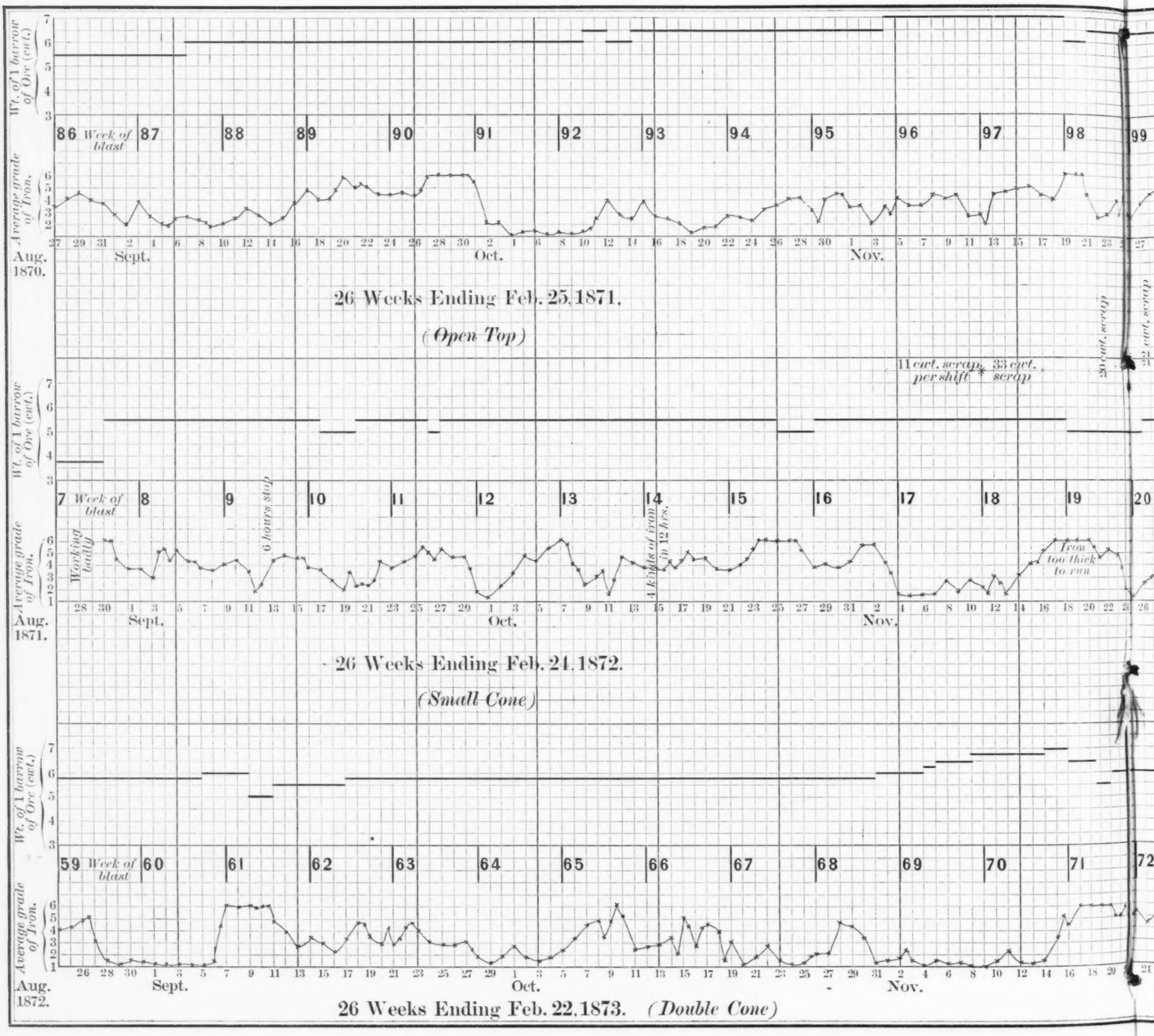
January	850	July	1,220
February	800	August	1,100
March	1,033	September	1,200
April	850	October	1 250
May	1,095	November	1,700
June	1,050	December	1,500
Total			13,648
1874			9,084
Increase 50 per cent.			4,564

A PROFITABLE MINE—36 PER CENT. DIVIDENDS.

From HORATIO P. LIVERMORE, Treasurer of the Redington Company, we have received, in manuscript, the following report of that mine. It is as follows: "The Redington Quicksilver Company, during January, February, and a portion of March, 1875, were not producing Quicksilver, being engaged in adding to and changing their reduction works. In March they got their reduction works well under way again, and their reduction for the current year ending December 31, 1875 (say ten operative months), has been 8,080 flasks Quicksilver. Since September 1st their production has been upward of 1,000 flasks per month, at which figure it closes the year. This increase of product is in a great degree due to the marked success of two new furnaces for the reduction of fine ores or Tierras. These furnaces are the invention of the Superintendent of the Company, CHAS. E. LIVERMORE, and they may safely be said to introduce a new element into Quicksilver reduction, making it possible to profitably utilize material largely produced by all Quicksilver mines, but heretofore handled always at no profit, and frequently at an absolute loss. The Redington Quicksilver Company have now in active, continuous operation four of the KNOX & OSBORNE patent furnaces, and two of the LIVERMORE patent fine-ore furnaces, their total reducing capacity being upward of 120 tons of ore per day. This large quantity of ore is easily yielded by the upper levels of the mine, none having yet been drawn from below the 200-foot level. The mine has, however, been opened by shaft to the depth of 400 feet, and constant prospecting work is maintained in advance, so as to insure a supply of ore for at least two years ahead of requirements. The company employs 300 men in its various departments, and has very extensive works, the whole affording a most striking example of what careful management on a strictly business basis may accomplish. Such results have been attainable by reason of the fact that the management of the mine has been carefully attended to by the comparatively few individuals who own it; and the property, though incorporated as a stock company, has never been on the stock market for sale and speculation, but has always been handled as a legitimate operative business. It has, during the past year, enjoyed a profitable contract with FLOOD & O'BRIEN, to supply them with 500 flasks per month, and this contract is still in force. The capital stock of the company is $1,260,000, in 1,260 shares of $1,000 each, and regular monthly dividends of $30 per share have been paid thereon during 1875, or $37,800 per month, making a total of $453,600 divided profits for 1875. Besides this, at least $125,000 has been invested in new land purchases, buildings, machinery, new reduction works, and other appliances, adding largely to the value and future productiveness of the property." We learn from an official source that the total available cash of the Redington Quicksilver Company, during 1875, including a surplus brought forward January 1st, amounted to $780,134.28; dividends in 1875, $453,600, leaving balance $326,534.28 for running expenses. This is certainly a very handsome exhibit for the company, when we recall to mind the fact that in January, 1875, prices ruled as high as $1 50@1 55; February, $1 30@1 35; March, $1 15@75c. per lb.; April, 70c.@65c; and these were ruling rates during the balance of the year; closing price, 62½c. It should be stated, moreover, in justice to the Redington Company's exhibit, that they claim to have had on hand, a year ago, a large surplus stock of Quicksilver, which they sold at $1 50@1 30, cleaning all out before the great decline, and leaving them in possession of a monthly contract at a fixed price, and which, we understand, has been extended for another three months with the same parties, contracting with them a year ago; probable price, 70c.

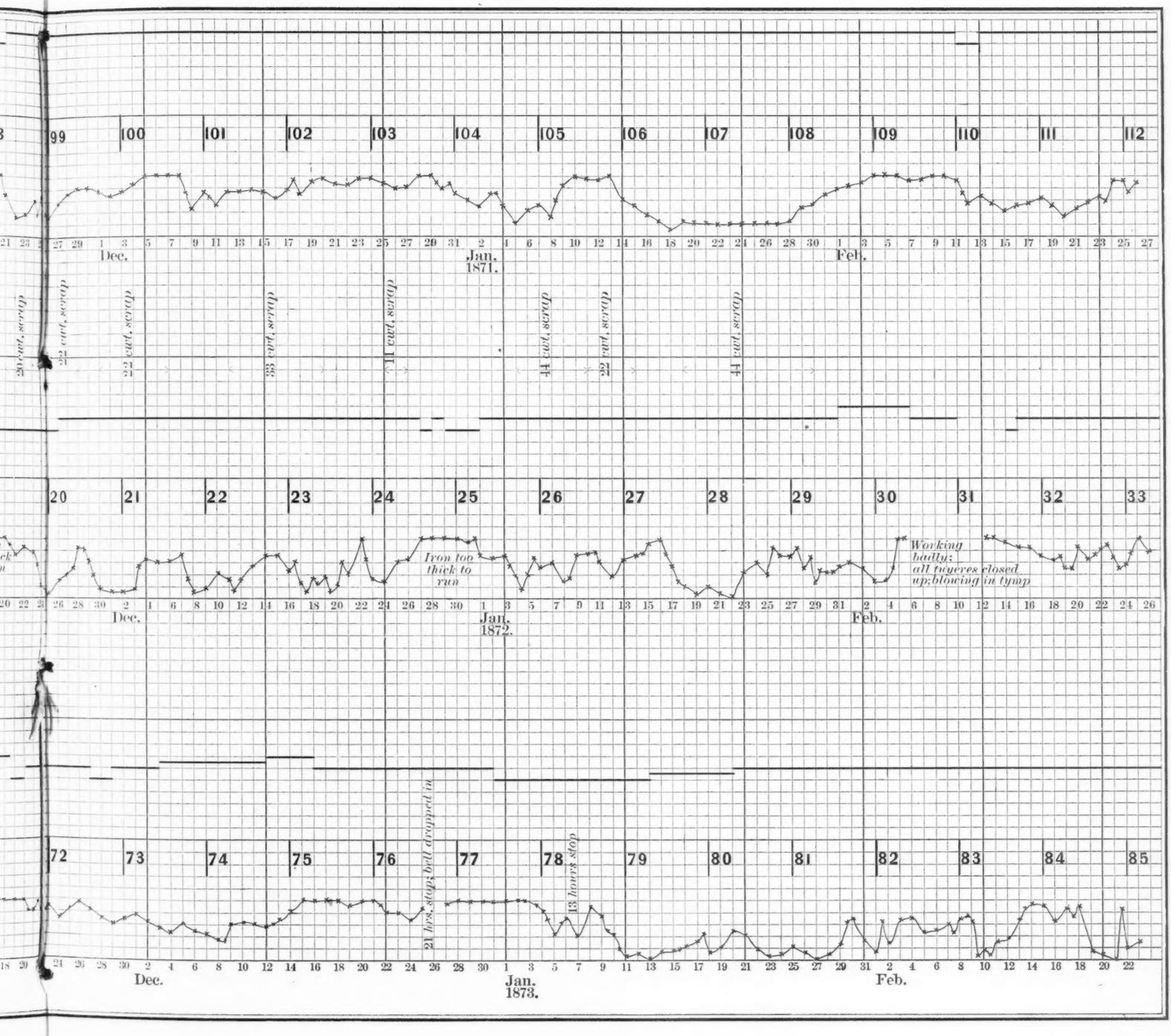
The *Bulletin* gives the following as the production:

New Almaden, flasks	13,648	Brought forward	46,642
New Idria	8,800	Sunderland	1,500
Redington	8,080	Cloverdale	714
Sulphur Bank	5,215	Buckeye	700
Guadaloupe	3,415	Manhattan	437
Great Western	3,384	Great Eastern	413
St. John	2,100	Phœnix	300
Oceanic	2,000	Various	3,000
Carried over	46,642	Total	53,706



COMPARISON OF RESULTS FROM OPEN-TOPPED AND CLOSED-TOP

(SEE PAGE



-TOPPED FURNACES. By Frank Firmstone, Glendon Iron Works, Easton, Pa.

(SEE PAGE 154.)

ENGLISH IRON WORKS.

Special Correspondence of the Engineering and Mining Journal.

SOUTH STAFFORDSHIRE DISTRICT.

BIRMINGHAM, England.

THE Lloyd's Patent Rolled Shafting Company, so named for the reason that it was first started to make shafts and axles after the patents of a clergyman named LLOYD, has grown to be one of the largest iron and steel manufacturing concerns in South Staffordshire.

These works are located at Wednesbury. The peculiarity of the patent shafting made at these works is due to the form and manner of piling the iron out of which it is rolled. The piles are built up so as to be circular, and the pieces composing it have a wedge-shaped section, the points being nearest the center. What particular advantages it possesses over the ordinary kinds of shafting are not very apparent.

At these works are the only two Bessemer converters in the district. In construction they are of the common English type. The steel made from them is used for rolling into rails and tyres. Most of the Bessemer iron now used by the company is made in other districts, it having been found, by experience, that the cost of bringing the ore from Cumberland and Spain and the coke from Durham, was too great for profitable working. To partially supply the large puddling department of these works, the company work three blast furnaces. Each of these are 46 feet high, 14 feet diame er at the boshes and 5 feet diameter in the crucible. The blast is forced in through six tuyeres. The tuyeres themselves are made of wrought iron, the space between the inner and outer casings being kept entirely filled with water. The battered and cracked appearance of these and other furnace stacks in South Staffordshire are standing warnings against the use of this naturally dangerous form of tuyere. Long experience has shown that where these tuyeres are used in furnaces working a considerable proportion of mill cinder and making, at the same time, white iron, that unless the most careful and constant attention be paid to their condition, the iron will be burnt off their ends.

The quite large body of water that is thus suddenly precipitated into the furnace is, without doubt, the cause of many of the explosions that have cost so many workmen their lives. The reason that is given generally for using them in preference to the cast iron coil tuyere is that the latter wear large at the mouth too soon and are not susceptible of repair like the former.

At these works the tuyeres are changed every three days, and in consequence no serious explosion has taken place in some time.

The furnace gases are taken off by means of a cast iron bell-mouthed pipe, which is suspended over and hangs down in the throat of the furnace to a depth of four feet. This form of gas-taking apparatus, which is hardly known in the United States, is still used in many furnaces of this district, and also in Shropshire. Although it is said not to interfere with the regular working of the furnaces by preventing the proper mixing of fuel, ore, and limestone it is objectionable on account of the quite rapid burning away of the end of the tube which is placed in the furnace. The blast is heated to about 800° Fah. in U pipe stoves. The exteriors of the stoves are always carefully kept whitewashed, partly for appearance sake, and also because the manager has discovered that by this means the cooling down of the pipes by high winds is almost entirely prevented. This result would hardly be looked for from such a simple cause.

The boilers at these furnaces include nearly every variety which has been invented since the time of WATT—wagon top, box, dome, cylinder, etc. One of the blowing engines there is a horizontal one, a thing rarely seen in England. To make the ordinary No. 3, or gray forge iron for puddling, a mixture of ½ Spanish hematite, ½ native calcined clayband, and ½ mill cinder is used. To smelt this from 42 to 45 cwt. of coal is used, part of which is in the form of coke. Most of the coal of South Staffordshire, like that of North Staffordshire, is dry in its nature and does not coke well. With this mixture of ores the furnaces produce from 150 to 170 tons of iron per week. One of these furnaces was formerly used for making Bessemer iron out of a mixture of Spanish hematite and Northamptonshire ores, which mixture worked so smoothly and cleanly that for a period of nearly two years the furnace never needed to be worked.

About two miles from these works is the establishment of the Darlaston Iron and Steel Company. They manufacture all kinds of bar iron, but make a specialty of pipe (skelps ?) Quite recently one of BROWN'S patent trains has been erected at these works for rolling this pipe iron. They consist of two pairs of rolls set at the same level in double housings. Each pair of rolls is geared to run in opposite directions so as to alternately engage the pile being worked.

The interference of the bloom with the set of rolls which are turning in a contrary direction to that in which it is traveling is avoided by making large grooves in the second set of rolls. In spite of this great waste of space on each set of rolls the system seems to be much liked where it has been tried.

At the Britannia Works of Middlesborough a similar plant has been at work two years making rails. A number of charcoal forges are employed at the Darlaston Works for making wire iron. They only use wrought scrap to make the blooms from. The blast furnaces belonging to the company are three in number, two 64 feet high and one 54 feet.

The coal which this company has to use in these furnaces is so light and non-coking in its quality that after repeated trials the attempt which was made to adopt closed bell tops had to be abandoned. The reason for this was on account of the difficulty of getting the blast to work freely through the furnace when the tops were closed. Since then, by using side flues and a large draught chimney, the gases are drawn off with facility without closing the tops. A very great variety of ores are used in making the iron, not one of the least of which is puddler's cinder. This however, is submitted to a previous calcination in open heaps which operation gets rid of some of the sulphur and also renders the material more infusible. The great trouble which has been experienced here in the past by leaky tuyeres and consequent explosions has led the manager, Mr. HEELEY, to invent a form of tuyere which seems likely to obviate all possible danger from this source.

The body of the tuyere is made in the same manner as the ordinary wrought iron one, with the exception that the back end is omitted. In the space between the inside and outside walls of the tuyere a coil pipe closed at one end and pierced with five holes, is loosely fitted. The holes are so placed that when a slight pressure of water is let into the pipe it is thrown out so as to quite thoroughly moisten the nose and walls of the tuyere. In setting the tuyere in the furnace it is given a slight pitch from the nose backwards so that as fast as the water does its work of cooling, it falls down and runs out of the tuyere from whence it is carried to the ordinary drain pipes.

With this arrangement it is impossible to collect any body of water in the tuyere at one time, and even if the whole nose were to burn off, the force of the blast is abundantly strong to prevent any of the small jets of water in that part of the coil from entering the furnace. The keeper of the furnace, too, has the opportunity of looking away into the tuyeres and seeing the condition which they are in. The coil is made with a rubber connection to the service pipe so that it can he withdrawn at any time. The cooling influence of the air alone is so great that on one occasion when the water by accident was shut off for a few minutes, the only result was that the tuyeres became red-hot but did not melt. The one great weakness in this invention seems to be the liability of the holes in the coil to be filled up with fine particles of dirt which are frequently found in tuyere waters, as well as to the formation of incrustations.

Where, however, the use of the ordinary tuyeres is attended by frequent accidents, these difficulties can be provided for. These tuyeres are now receiving a thorough practical trial at the West Cumberland Steel Works and Mr. SNELUS, the Manager there, will, before long, be able to express an opinion as to their value.

One of the most modern and best equipped furnace plants in the South Staffordshire district, is that belonging to the Rough Hay Company. The number of these stacks is three, each of which has the following dimensions: 55 feet in height, 15½ feet diameter, at the boshes, and 5½ feet at the hearth. They are all open topped but are made with side flues for taking off the gases. The dam in the fore hearth is made 4½ feet high in order to keep the cinder above the level of the tuyeres. The latter are put in a little over three feet from the hearth so that, except immediately after casting, the blast has to force itself up through a considerable mass of cinder. The Manager at these works is convinced from long experience, that by this means a portion of the heat contained in the cinder is taken up the blast, thereby effecting a considerable reduction in the amount of coal used, over the ordinary method of blowing. The tuyeres used at these works are cast in gun-metal and have the same form as the wrought iron tuyere without coil. They are much superior to the iron coil in respect to their property of not having any affinity for the reduced iron in the furnace. They do not, either, show any appreciable wear after months of use, the only way in which they become disabled being by the cracking of the metal, generally in the face of the nose.

In a years work of each furnace the number of new tuyeres required is from seven to ten. Their first-cost is about thirty dollars a piece in currency and three of the cracked tuyeres will buy two new ones. Water dams are used on all the furnaces.

The heating stoves are exceptionally large, there being but one to each furnace, while the temperature of the blast is kept up to fully eight hundred degrees Fahrenheit. These each contain three rows of flat U pipes 16 feet high, and seven pipes in a row. The blast enters on one side of this range and traverses it to the other side. A very striking peculiarity in these stoves is the way in which the gases are taken in and burned. Instead of entering at the bottom as is usual, the gases are admitted through six openings in the top, and, after being burned there they, find their way to the bottom, where the flues to the chimney are placed. By thus reversing the natural direction of the heated products of combustion, it is through this the pipes are kept at a higher temperature. One objection which this arrangement would seem to possess, is the apparent liability of the air to get in and inflame the gases in the tubes before they enter the chamber. Its practical working is, however, said to be very satisfactory.

WIRE ROPE AND CHAIN TOWING.

A BERLIN correspondent writes :—"Towage on the river Oder between the Baltic and Breslau, the capital of Eastern Prussia, a distance of 310 miles, is now being carried out on a different, and, I am convinced, an improved system to that followed on the Elbe and other rivers. In place of the heavy chain weighing 22 tons per mile, we employ a light and supple wire cable, weighing only 56 cwt. per mile. In lieu of the heavy, cumbersome chain-towing steamers that are racked to pieces in a few years by the continuous grinding, jolting, and friction of the chain, we have adopted light, yet powerful steamers, in which our principle aim has been to combine every working part so as to diminish friction, to use the wire cable tenderly, and the steamers as the direct instruments for applying the motive power to the work to be done. It is not too much to say that on a wire-cable steamer of this system, friction is reduced to a minimum, so that with a train of barges in tow, and running at a speed of five miles per hour against a current of six miles per hour, no noise whatever is heard beyond the regular clicking of the friction couplings and the escape of the waste steam ; whereas, on a chain-steamer the passage of the chain over the drums and pulleys produces such friction and noise as to make talking, and often shouting, perfectly useless. The comparison between the chain and wire-cable system speaks for itself. Under similar conditions, the wire-cable steamer consumes but 55 per cent. of the fuel consumed in a chain steamer, the wages accounts being the same. Wear and tear and renewals only 40 per cent. of that of chain steamers ; the first cost of the entire establishment on the wire-cable system 30 per cent. less than that of the chain system. An Oder wire-cable steamer, capable of towing 2,500 tons of floating weight, barges and cargoes, at a speed in still water of ten miles per hour, draws 20 inches of water, with three days' fuel and all stores on board ; and may best be considered as a low speed, powerful locomotive, including tender and accommodation for crew together. I am convinced that this system might advantageously be supplied on many English rivers and canals, and it would materially assist in facilitating cheap, heavy, and to the railways unprofitable traffic. I even go so far as to assert that in many parts of England and other countries, where there is a large mineral or heavy goods traffic, it would pay to build canals especially to be worked entirely on this system."—*Iron.*

HOT BLAST REFINING FOR PIG IRON.—M. FERNAND HAMOIR turns a hot blast into the blast furnace just before the metal is run, the operation being performed rapidly with a cheap and simple apparatus. The advantage obtained is a pig which gives, it is said, one charge more to the puddling furnace in twenty-four hours, and an iron perfectly refined and capable of being welded. The books of the ironworks where this method was adopted show an increase in the production of iron, when the hot blast was used, amounting to an average of 250 kilogrammes—4 cwt. 3 qr. 19 lb.—per charge. The loss due to the blast is compensated for by a diminished waste in the pudoling furnace which does not exceed 7·88 per cent.—*Trade Review.*

IN CONSEQUENCE OF THE HIGH PRICE OF GAS in Camden, $3.60 per 1,000 feet, many persons are dispensing with its use. and some are illuminating their houses with gasoline. There has been talk that the company is going to reduce the price, but no definite knowledge can be obtained as to the truthfulness of the rumor.—Philadelphia *Transcript*, Feb. 13, 1876.

SELECTED LIST OF PATENTS.

FOR THE WEEK ENDING FEB. 11, 1876.

Relating to Mining, Metallurgy, Gas Making, Engineering, etc. Reported for the "Engineering and Mining Journal" by Louis Bagger & Co., Solicitors of Patents, Washington, D. C.

172,637. Mining Machines, Francis M. Lechner, Waynesburg, Ohio.—The main frame carries a sliding frame and driving mechanism, which latter is connected with the cutter shaft by means of an endless chain. The sliding frame is advanced by a nut upon the screw-rod, operated by and connected with the driving mechanism.

172,654. Steam Vacuum Pumps, W. E. Pratt, Washington, D. C.—Steam confined in the recess, when the valve has closed one port and opened the other, assists in moving said valve upon a reduction of pressure in the open port, caused by condensation or exhaustion of steam in the pump with which it connects.

172,691. Apparatus for Extracting Mercury from its Ores, Hippolyte Berrens, Barcelona, Spain.—The condensers are lined with charcoal to facilitate the condensation of the metallic vapor, and are made in the form of double cones, the lower half being embedded in the ground, the upper half being covered or partly covered with water.

172,774. Gas Regulators, Isaac Rehn, Philadelphia, Pa.—A gas check or regulator in which a flange or shoulder is combined with a movable disk having notches or openings, arranged to be closed by the said shoulder when the disk is raised.

172,721. Drive-Well Points, James Doland, Islip, N. Y.—A perforated tubular section provided with a surrounding perforated jacket or strainer, whereby a means is afforded for the inflow of water for testing purposes without disconnecting the point; also a double perforated tube or strainer extending above and below the point coupling, whereby the said strainer, when exposed to the water, shall be practically free from corrosion.

NOTES.

WASTE OF WATER.—A bill was introduced in the California Assembly making it a misdemeanor to waste the water which overflows from Artesian wells.

MISSOURI MINES.—The product of ore yielded by the zinc mines of Missouri during the year 1875 was equal to 24,800 tons. This has netted to the miners an average of $18 per ton, or a total of $446,400. During the same period, the production of lead amounted to 579,202 pigs, equal to 39,544 lb., worth about $2,372,648.

SPONTANEOUS COMBUSTION OF COAL ON BOARD SHIP.—There has lately been a considerable increase in the number of cases of fire arising from this cause. From statistics, collected by Mr. R. C. RUNDELL, and given by him in a report to the Underwriters' Association of Liverpool, it appears that, taking the number of vessels carrying upwards of 500 tons of coal which have sailed from the United Kingdom for ports south of the equator during the first nine months of the years 1873 and 1874, the number of casualties from spontaneous combustion was 23, or about 2 per cent. of the total number of vessels in 1873, and 50, or about 4 per cent. in 1874. The statistics further show that the fires are not confined to one kind of coal, but have occurred in most, if not all, kinds exported from all parts of the United Kingdom.

ST. LOUIS METAL RECEIPTS FOR 11 YEARS:—

Years.	Lead, pigs.	Pig Iron, tons.	Iron Ore.	Zinc slabs.	Zinc Ore, tons.
1865	116,636	21,704			
1866	149,584	41,386	12,530		
1867	144,555	30,027	48,550		
1868	185,823	44,067	54,380		
1869	221,817	46,468	97,180		
1870	234,428	42,397	350,657	50,212	
1871	229,691	45,058	202,795	16,308	
1872	285,769	84,809	379,722		
1873	350,040	57,571	179,079	43,598	
1874	455,151	47,718	165,515	78,753	16,615
1875	579,202	43,184	137,871	281,980	12 780

A ZINC SMELTING COMPANY HAS BEEN ORGANIZED at Baxter Springs, Kan., and it is expected that the works will be in running order in sixty days.

THE BELGIAN COLLIERS' WAGES.—The Brussels correspondent of the *Pall Mall Gazette* writes:—With reference to the present strike of the Belgian Colliers, M. GRAVEZ, director of the Society de Sars, LONGCHAMPS, states, in the *Organe de Mons*, that in 1872 and 1873 the wages of the pit workmen had been increased from 55 to 60 per cent. and those of the workmen above ground, 30 per cent. and that since then, notwithstanding the enormous fall in the price of coal, no change had been made in the wages. The reduction made since the 1st of last December is on an average of 15 per cent. on the wages of the pit workmen, leaving them still an advance of from 40 to 45 per cent. on the former wages. The wages of the above ground workmen are left untouched. As to the pay of the colliers who are paid by the square metre of coal extracted, in 1870 a workman extracted 6 metres, at 80c.; earning 4f. 80c.; in 1871, 5.90 metres, at 80c. earning 4f. 72c.; in 1872, 6.20 metres, at 84c. earning 5f. 11c.; in 1873, 5.80 metres, at 1f. 11c. earning 6f. 45; in 1874, 5.30 metres, at 1f. 15c. earning 6f. 20c.; in 1875, 5.25 metres, at 1f. 15c., earning 6f. 3c. M. GRAVEZ points out that the constant decrease of the work done explains many things. By doing now the same day's work as in 1875 the daily earnings of a collier working by the square metre would, notwithstanding the reduction of 15 per cent., be 5f. 24c.; and if he consented to do the same day's work as in 1872 they would be 6f. 20c. *i.e.*, superior to the average earnings of 1875, and nearly equal to those of 1873 when the price of coal was at the highest point.

AFRICAN DISCOVERY.—The results of Lieutenant CAMERON'S journey across tropical Africa, communicated from the Portuguese settlement of Loando, were recently laid before the Geographical Society in London. They are highly important. Although unable to follow the outflow of Lake Tanganyika, his observations leave no doubt that it drains into the Congo, and not the Nile, as was believed by LIVINGSTONE. The distance traversed by Lieut. CAMERON includes a route of twelve hundred miles, over altogether new ground; and what is of great importance, he has registered, with much accuracy, an extraordinary number of lunar observations, laying down a sound geographical basis for the further exploration of the continent. The southern tropical portion of Africa is much healthier and also richer than the northern. It is probable that if properly worked the country between the central lakes and the Atlantic would prove the most productive in the world. "The interior," says Lieut. CAMERON, "is mostly a magnificent and healthy country of unspeakable richness. I have a small specimen of good coal; other minerals, such as gold, copper, iron, and silver are abundant, and I am confident that with a wise and liberal expenditure of capital, one of the greatest systems of inland navigation in the world might be utilized, and in from thirty to thirty-six months begin to repay any enterprising capitalists that might take the matter in hand." He thinks that with a capital of from one or two millions central Africa might be thrown open to trade in about three years.

A STRANGE SICKNESS IN ORE MILLS.—In all the mills in which ore from the Consolidated Virginia Mine is worked the men in the amalgamating departments are, more or less, affected by a new and peculiar illness. They shake as though afflicted with palsy. Their hands shake so badly that they can hardly raise a cup of coffee to their mouths. The sickness does not seem to inflict any permanent injury, as when those affected cease to work for a few days they recover their usual health. No less than ten men who have been working at the new California mill are now lying off on account of this "shaky sickness." It is not known whether the sickness is owing to some mineral entering into the composition of the ore, or whether it is caused by the chemicals. In working the ores of the bonanza bluestone (sulphate of copper), chemicals, as cyanide of potash and the like, are used in much larger quantities than when poorer ores are treated, and by some it is supposed that here lies the source of the trouble and the cause of the new sickness. The pans are closely covered, during the time a charge is being worked, then when the covers are finally raised a great column of steam impregnated with chemicals and volatilized quicksilver rushes up, portions of which the men undoubtedly inhale. Except when it is storming, the windows of a mill might as well be opened as not—some of them, at least—as when a mill is in operation it is always quite warm enough to allow this. One shift of men will say that they cannot be bothered with the windows—that they can stand it their shift out—and so it goes, all working on as usual and nobody looking after the ventilation. When the matter shall be properly investigated it will probably be found that the sickness among the men is caused by breathing the exhalations of chemicals from the pans and not by any deleterious mineral in the ore.—Virginia City (Nev.) *Enterprise*.

STATISTICS OF COAL PRODUCTION.

This is the only Report published that gives full and accurate returns of the production of our Anthracite mines.

Comparative Statement for the week ending Feb. 12.

Tons of 2,240 lb.	1876.		1875.	
	Week.	Year.*	Week.	Year.*
Wyoming Region.				
D. and H. Canal Co	†	240,866	41,246	281,339
D. L. and W. RR. Co	†	207,912	29,386	201,251
Penn. Coal Co	22,230	131,776	20,439	138,637
L. V. RR. Co	11,575	120,747	24,825	131,710
P. and N. Y. RR. Co	176	3,952	....	....
C. RR. of N. J	4,631	107,280	765	16,786
	38,612	812,533	116,661	769,723
Lehigh Region.				
L. V. RR. Co	15,990	192,246	2,882	78,064
C. RR. of N. J.	9,537	137,443	....	....
D. H. and W. B. RR.	646	3,499	649	1,735
	26,173	333,188	3,531	79,799
Schuylkill Region.				
P. and R. R. RR. Co	27,837	248,188	14,780	75 527
Shamokin & Lykens Val.	980	23,786	11,074	46,950
	28,817	271,974	25,854	122,477
Sullivan Region.				
Sul. and Erie RR. Co	1,072	6,720	132	1,346
Total	94.674	1,424,415	146,178	973,345
Increase	..	..	..	..
Decrease	..	..	..	..

* Year beginning January 1st.

† These reports were not received this week.

The above table does not include the amount of coal consumed and sold at the mines, which is about seven per cent. of the whole production.

The receipts at Port Richmond for the week were 5,000 tons, shipments 5,500 tons, and balance on hand 136,000 tons.

The decrease of shipments of Cumberland Coal over the Cumberland Branch, and Cumberland and Pennsylvania Railroads amounts to 493 tons, as compared with the corresponding period in 1875.

Perth Amboy business:

	Tons.
Received for the week	398
Shipped for the week	6,695
On hand Jan. 29	93,948

Receipts of Coal at Boston, for week ending Feb. 11, and years from September 1st, 1874 and 1875.

From	Week. Tons.	Previously. 1876. Tons.	1875. Tons.
Alexandria and Georgetown	—	53,052	45,700
Philadelphia	2,500	333,402	245,032
Baltimore	3,462	68,131	69,044
Other places	1,932	142,624	99,487
Great Britain	102	1,229	1,733
Nova Scotia	—	12,851	14,105

The Exports of Coal from Baltimore for the week were 000 tons, and since Jan. 1st, 3,557 tons, as against 5,864 tons for the corresponding period of 1875.

Belvidere Delaware RR. report.

	Week.	Year 1876.	Year 1875.
Receipts of coal at Coal Port (Trenton)	1,937	6,550	..
" " " South Amboy	3,764	30,767	16,095
Shipments at Coal Port (Trenton)	—	..	..
" South Amboy	5,036	37,718	31,579

The Production of Bituminous Coal for the week ending Feb. 12, was as follows:

Tons of 2,000 lb., except where otherwise designated.

	Week. Tons.	Year. Tons.
Cumberland Region, Md.		
Tons of 2,240 lb	18,578	113,545
Barclay Region, Pa.		
Barclay RR., tons of 2240 lb	4,163	42,129
Broad Top Region, Pa.		
Huntingdon and Broad Top RR	3,655	16,871
*East Broad Top	659	6 434
Clearfield Region, Pa.		
*Snow Shoe	217	3,927
*Tyrone and Clearfield	6,940	72,670
Allegheny Region, Pa.		
*Pennsylvania RR	1,034	16,893
Pittsburgh Region, Pa.		
*West Penn. RR	1,570	18,267
*Southwest Penn. RR	502	6,135
*Penn. & Westmoreland gas coal, Pa. RR.	4,650	58,696
*Pennsylvania RR	1,337	30,515
Kanawha Region, W. Va.		

* To Jan. 31.

The Production of Coke for the week ending Jan. 31.

Tons of 2000 lb.	Week. Tons.	Year. Tons.
Tyrone and Clearfield	..	..
Alleghany Region	..	..
West Penn. RR	383	3,883
Southwest Penn. RR	2,892	36,087
Penn. & Westmoreland Region, Penn. RR.	242	2,952
Pittsburgh, Penn. RR	1,217	19,860
Total	4,734	62,782

COAL TRADE REVIEW.

NEW YORK, Friday Evening, Feb. 18, 1876.

Anthracite.

There is but very little coal moving, and what there is, is being sold at very low prices, but for cash, or to parties whose credit is undoubted. Such ports as have been open all winter are over-supplied, while those which were unexpectedly closed in November, and have since remained so, are but fairly stocked.

The past week has added a few coal firms to the list of failures Among others announced are CANFIELD and QUINTARD of this city, a young firm with not very extended liabilities; DAVIS BROTHERS, Middletown, Conn.; W. E. DENNISON, Portland, Maine; GEO. R. HOTCHKISS, New Haven, Conn., and several of less note.

E. B. ELY & Co., whose failure we announced last week, have issued a circular asking for a meeting of their creditors, at their office, at one o'clock P. M., on the 21st inst. E. A. PACKER & Co. have not yet arranged for a meeting of their creditors. Much sympathy continues to be expressed for both of these firms, and it is thought that extensions will be granted them by their creditors.

The high appreciation in which these trade reports are held by business men and the press, is very satisfactory. We are, at all times, pleased to have our contemporaries copy them, but courtesy should cause them to give us credit for information obtained by us at considerable expense. There are, nevertheless, some of our exchanges that rarely do this, among these we note, particularly, a Philadelphia paper, that makes up almost its entire coal and mining columns, weekly, from our Market Reports of the previous week, simply changing the wording a little and spreading it over a good deal of space, yet, it rarely has the courtesy to acknowledge the source from which it draws its information.

This is, certainly, an economical manner of conducting

a trade journal, but it is scarcely what might be expected of one making great pretensions.

THE COMBINATION PROGRAMME FOR 1876.

The following Programme was communicated by the Combination to the *Evening Post* of to-day. In reproducing it we have corrected some inaccuracies, and have added the important items of the amount of coal on which the programme is based, and the difference to be maintained between the prices to contractors and the general public.

We have made a comparison in the table below of the prices of manufacturing coals to consumers this year, with those changed in 1875 to the trade after deducting, as we have done, the commission of 15 cents per ton allowed last year—prices this year being *net*.

From this comparison it appears that the prices this year are from 25 to 46 cents per ton *less* on lump, steamer and broken coal, and from 25 cents less to 5 cents greater on chestnut coal than they were last year. On the the programme makes a liberal concession to the needs of manufacture, and in this follows the course constantly advocated by this jonrnal.

For dealers or middlemen, there seems to have been little consideration, and in fact the policy of the Combination has always been to dispense with their services. There seems to be small room for them under the terms of this programme.

We shall discuss the several questions involved in this important statement of the policy of the Combination on another occasion, the fact that the meeting at which the programme was adopted, adjourned but a few hours before we go to press, is sufficient reason for devoting no more space to the subject at present.

"An important meeting of the several great coal-producing companies of New York and Pennsylvania has been in session to-day and yesterday in the office of the Delaware and Hudson Canal Company in this city, at which a permanent organization of the so-called Board of Control was effected, and a series of rules regulating the coal traffic of the seaboard and a schedule of prices for the government of the trade for the ensuing year was adopted.

The companies represented at the meeting were the Delaware and Hudson Canal Company; Delaware, Lackawanna, and Western RR.; Pennsylvania Coal Company; Philadelphia and Reading RR.; Lehigh Valley RR; Lehigh and Wilkesbarre Coal Co. or New Jersey Central RR. The board was organized by the election of THOMAS DICKSON, of the Delaware and Hudson Canal Company, as president, and FRANKLIN B. GOWEN, of the Philadelphia and Reading RR. Co., secretary. In addition to the companies named above, the Pennsylvania R.R. Co. has given its adhesion to the rules of the board, although not an actual member.

The rules adopted by the board are, in substance, as follows:

"The first article provides for the actual entrances of all coal reaching any point on the Hudson River, or Bay of New York, and which passes out of the capes of Delaware.

"Article second gives the distribution to the various companies.

"Article third provides for the manner in which the monthly and yearly quotas shall be ascertained.

"Article fourth requires that returns shall be made to the Secretary of the Board on the 10th of every month.

"Article fifth provides for a meeting of the Board on the 20th of each month, when a statement of tonnages will be presented, and companies in excess are required to pay to the Treasurer $1.50 per ton, which shall be paid to the companies who are deficient.

"Article sixth provides for the election of officers.

"Article seventh regulates the price of coal, and makes the free on board' price in New York thirty-five cents per ton more than the 'free on board' price at Port Richmond for all sizes except chestnut, which may be sold by the Reading Company at eighty-five cents per ton less than the New York price. This difference is made for the purpose of equalizing the quality of coal.

"The agreement for regulating the prices of coal for the ensuing months to January 1 1877, is as follows:

"The contractors' prices for the month of March will be as follows, free on board in New York—

Lump	$4 40	Egg	$4 70
Steamer	4 50	Stove	5 30
Grate	4 60	Chestnut	4 50

"That season contracts with consumers only be made for lump, steamer, broken and chestnut coals at the following rates, free on board in New York:

	Lump.		Steamer.		Broken.		Chestnut.	
	1876.	1875.	1876.	1875.	1876	1875.	1876.	1875.
March and April.	$4.20	$4.45	$4.30	$4.55	$4.40	$4.65	$4.30	$4.25
May	4.25	4.65	4.35	4.75	4.45	4.85	4.35	4.45
June	4.30	4.75	4.40	4.85	4.50	4.95	4.40	4.55
July	4.35	4.85	4.45	4.95	4.55	5.05	4.45	4.65
August	4.40	4.85	4.50	4.95	4.60	5.05	4.50	4.75
September	4.45	4.90	4.55	5.00	4.65	5.10	4.55	4.80
October	4.50	4.90	4.60	5.00	4.70	5.10	4.60	4.80
November	4.55	4.90	4.65	5.00	4.75	5.10	4.65	4.80
December	4.60	4.90	4.70	5.00	4.80	5.10	4.70	4.80

and at fifty cents per ton less free on board in Philadelphia, except for chestnut coal which may be sold at eighty-five cents per ton less than the free on board price in New York. It being provided that all such contracts shall be made in writing, prior to April 1st, and that no commissions or allowances of any kind be made thereon, and that no such contracts be made with any other than a consumer of coal.

"That all sales to be made for cash, or with seven per cent. interest added in all cases for any deferred payment—the interest to begin from date of bill of lading; and all deliveries of coal be charged at the circular prices current in the month when the delivery is made; and under no circumstances shall the coal shipped in one month be charged at the circular prices of a preceding month, unless the purchaser had a vessel at the shipping point ready to receive the coal before the expiration of the previous month, and was acctually entitled to receive the coal during such previous month.

"That no coal shall be sold by any party in any other manner than is above provided, or at any less prices, either directly or indirectly, than those above named, or which may from time to time be established as the monthly circular rates by the Board of Control.

"That nothing but competitive tonnage shall be subject to the direction of the Board of Control; and that each interest shall have the absolute and exclusive control of its local trade.

"That each transporting company shall be held responsible for the faithful adherence to these regulations on the part of all individual shippers using its lines to carry coal to competitive points.

"The business of the Board of Control is to be hereafter concentrated at the office of the President in New York."

There is but little to be added to the above. The quantity of coal to be shipped to competitive points is fixed at 8,500,000 tons. The allotments of each month, and also for the year, will be increased or decreased as the conditions of trade may suggest.

In addition to the above prices there will be circulars issued each month with prices 20c. per ton in advance of those quoted to contractors.

Bituminous.

But little is doing in these coals; it is too early in the season to expect much. Some exceptions have been taken to our giving in our last, $4 50 as a price for Clearfield coal. We used it to express the limit to which low prices have gone, and are aware that it is rather an exceptional, though an actual, case; some of the better descriptions of these coals are bringing about 50c. per ton more. It is claimed that bituminous coal cannot be sold without loss at that figure at South Amboy. This is probably the case, but with the depressed condition of trade it is not surprising that those whose financial necessities are pressing should sacrifice their coal.

At the annual election of the Consolidation Coal Company, held at their office on the 16th inst., the following officers were elected: ALLEN CAMPBELL, President; Directors. WILLIAM H. NEILSON, WILLIAM M. EVARTS, WALTON E EVANS, JAMES M. HARTSHORN, JOHN V. L. PRUYN, ROBERT GARRETT, WILLIAM F. BURNS, HENRY MEIGS, WILLIAM B. HOFFMAN, JOHN RILEY. There was the following ticket in opposition to the above: For President, FREDERIC G. FOSTER; for Directors, ADAM NORRIE, WILLIAM WHITEWRIGHT, WILLIAM M. EVARTS, JAMES ROOSEVELT, DAVID W. BISHOP, DAVID STEWART, GEORGE B. WARREN, Jr., LLOYD ASPINWALL, FRANKLIN H. DELANO, O. H. SHEPHARD.

The Baltimore and Ohio RR. interest, said to represent about 20,000 shares, voted with Mr. CAMPBELL'S party. This is not strange when we consider that an administration which should give concessions in freights on shipments to Cumberland, would materially increase the business by the Chesapeake and Ohio Canal, to the great disadvantage of the B. & O. RR.

Wholesale Prices of Anthracite Coal for Feb. f.o.b. at the Tide Water Shipping Ports per ton of 2240 lb.

	Lump.	Steamer.	Grate.	Egg.	Stove.	Chestnut.
Wyoming Coals.						
Lackawanna and Scranton at Hoboken and Weehawken	$4 65	$4 65	$4 75	$4 95	$5 50	$4 70
Pittston at Weehawken	4 5	4 50	4 60	4 80	5 35	4 55
Wilkesbarre at Port Johnston	4 65	4 65	4 75	4 95	5 50	4 70
Plymouth, R. A., *Net*	....	....	4 75	4 95	5 50	4 70
Susque. Coal Co. at Amboy W.A.	4 65	4 65	4 75	4 95	5 50	4 70
Kingston at Hoboken	4 65	4 65	4 75	4 95	5 50	4 70
Lehigh Coals.						
Old Company at Port Johnston	5 25	....	4 90	5 00	5 50	4 85
Old Company's Room Run "	5 25	....	4 90	5 00	5 50	4 85
§Sugar Loaf, Hobok. &Amb."	5 25	....	4 90	5 00	5 50	4 85
Lehigh Coal Exchange "	5 25	....	4 90	5 00	5 50	4 85
Honey Brook Lehigh	5 25	....	4 90	5 00	5 50	4 85
Beaver Meadow at South Amboy	5 25	....	4 90	5 00	5 50	4 85
Schuylkill Coals at North 9th st., Brooklyn, E. D.						
Schuylkill white ash	4 65	4 65	4 75	4 95	5 50	4 70
Schuylkill red ash	..	....	....	5 05	5 55	4 70
Shamokin white and red ash	..	..	..	....	5 70	4 75
Lorberry	....	....	....	....	....	....
Lykens Valley	..	..	6 40	6 40	6 40	...

Freight from Hoboken and Weehawken to New York	Per ton. 40c.
" " Elizabethport & Port Johnston to N. York.	45c.
" " South Amboy to New York	50c.

Wholesale Prices of Bituminous Coal.

Domestic Gas Coals.

Per ton of 2240 lb.	At the Shipping Ports.	Alongside in New York.
Westmoreland and Penn. at Greenwich, Philadelphia	$4 50	$6 00
" " at S. Amboy	5 50	6 00
Red Bank Cannel Pa. at Philadelphia	8 00	8 50
" " South Amboy	8 50	....
" Orrel	6 00	6 50
Youghiogheny, Waverly Co., at Balt.	4 25	6 00
Despard, West Va.,	4 50	6 00
Murphy Run, West Va., at Baltimore	4 50	6 00
Fairmount, West Va., " "	4 50	6 00
Newburgh Orrel, Md. " "	4 50	6 00
Cannelton Cannel, W. Va., at Richmond.	9 50	11 00
" Splint, " "	5 00	6 50
Peytona Cannel, " "	9 50	11 00
Straitsville " at Sandusky, O	3 25	10 00

Manufacturing and Steam Coals.

Cumberland, at Georgetown and Alexandria, Va	$4 00@4 25 5 25@5 50
Cumberland, at Baltimore	4 25@4 35 5 75@6 00

Broad Top, at the mine, per 2,000 lb., 1 10. f. o. b. Greenwich, Philadelphia per 2240 lb., 3 90, 4 00. 4 25 and 4 50, according to destination; at Amboy, 5 00; New York, 5 45.

Clearfield and Allegheny, "Kittanning," "Sterling," "Sonman," and "Eureka," at the mines, per 2000 lb., 90; at Greenwich, Phil., per 2240 lb., 3 90, 4 00, 4 25, and 4 50, according to destination; f. o. b. South Amboy, N. J., 5 00; New York, 5 45.

Foreign Gas Coals.

	Sterling.	Am. cur'cy,
Newcastle, at Newcastle-on-Tyne	9/6@11/	6 50@ 7 00
Liverpool House Orrel, at Liverpool	26/	13 00
Ince Hall Cannel "	42/	18 00@20 00
" Gas Cannel "	28/	13@14
Scotch Gas Cannel, at Glasgow, nominal,	25/	7 50
	Gold.	
Block House, at Cow Bay, N. S.	2 00	5 10
Caledonia, at Port Caledonia	1 75	5 25
Glace Bay, at Glace Bay	1 60	5 50
Lingan, at Lingan Bay	1 75	....
Sydney, International and Reserve mines, at Sydney	2 00	5 50
Pictou, Albion & Vale mines, at Pictou.	2 25	5 75

Retail Prices in New York.

Anthracite.

Per 2000 lb.	Grate and Egg.	Stove.	Chestnut.
Pittston coal, in yard	$5 50	$5 80	$5 00
Lackawanna coal, delivered	6 25	6 50	6 00
Wilkes-Barre, "	6 75	7 00	6 25
Lehigh & Locust Mountain, del'd	7 00	7 25	6 50
Schuylkill Red Ash, del'd	7 50	8 00	

Our retail quotations of Pittston Coal are based on the actual selling rates of the company, nominal quotations of grate and stove are 20c., and of nut 30c, per ton above these rates. The Cost of delivery ranges from 40 cts. to $1 10 per ton, according to distance from the yard.

Bituminous.

Liverpool House Orrel, delivered, per ton of 2000 lb	$23 00
Liverpool House Cannel " " "	† 22 00
American " " "	.... 15 00
Kahawha splint, " " "	.... 15 00
American Orrel " " "	....11@14
Red Bank Cannel " " "	..... 14 00
Cumberland " " "	..... 9 00

† This quotation is furnished to us by Messrs. WARD, TALBOT & OLYPHANT.

Baltimore, Md. Feb. 15, 1876.

Reported by our Special Correspondent.

No change.

ANTHRACITE.

Wholesale or Trade Prices per 2240 lb.

Wilkes-Barre "Lee" or "Diamond," Pittston and Plymouth. White ash.	In cars at depot.	By boats afloat.
Lump and steamboat	$4 80	$4 65
Broken	5 55	5 40
Egg	5 92	5 77
Stove	6 17	6 02
Nut	4 97	5 10
Shamokin, (red or white ash), and "Boston," freeburning white ash,		
Egg	5 95	5 79
Stove	6 15	5 99
Lykens Valley, red ash,		
All sizes	6 55	6 37

From wharf or yard, wholesale, 50@75c. additional.
By retail, all kinds and sizes, per 2240 lb. $7 00@8 00.

BITUMINOUS.

George's Creek and Cumberland f. o. b. at Locust Point	4 15	4 50
West Virginia f. o. b. at Locust Point		5 50
Youghiogheny Gas, f. o. b. at Locust Point		5 50
Swanton Coal, George's Creek		4 40

Boston. Feb. 15, 1876.

Reported by our Special Correspondent.

CARGO PRICES TO TRADE.

Lingan coal	$ 5 20	Westmoreland and Penn.	6 85
Caledonia	5 00	Waverly Co. Youghiogh'y.	6 80
Pictou	5 60	Cannelton Cannel	11 60
Block House	5 20	Cumberland	5 80@ 6 00
Red Bank Cannel	9 00	Anthracite	.6 50@ 7 25
Glace Bay	5 00	" retail	.7 50@ 8 00
Sydney	6 25		

Chicago, Ill. Feb. 15, 1876.

Specially reported by Messrs. RENO & LITTLE, Coal Merchants.

Retail prices per ton of 2000 lb. delivered to buyer.

No change in prices of coal.

		BITUMINOUS.	
Lehigh Lump	$10 50	Briar Hill and Erie	@ 7 00
Lehigh grate and egg	10 50	Walnut Hill, Pa	@ 6 50
Lehigh stove and chest.	11 00	Midway, Pa	@ 6 50
Lackawanna, Wilkes Barre and Pittston*		Cannel	@ 8 00
Grate and egg	9 50	Blossburg	7 50
Stove and chestnut	10 00	Indiana Block	6 00
		Hocking "Brooks"	6 50
		Wilmington and Illinois.	5 00

* 50 cents off these prices for car load lots to country dealers and manufacturers.

Cincinnati, O. Feb. 15, 1876.

Reported by our Special Correspondents.

Please quote following rates on coal here:

Per ton of 2000 lb.	Bush.	Ton.
Youghiogheny, or Pittsburgh, afloat	7½c.	—
Pomeroy coal	5 c.	—
Kanawha "	7½c.	—
Cannel coal, according to quality	16 c.	—
Semi-Cannel	7½c.	—

The following are the retail prices delivered

Youghiogheny —c.	$3 00
Semi-Cannel —c.	3 50
Pomeroy —11c.	2 50
Cannel —c.	5 50
Kanawha Semi-Cannel —c.	3 00
Anthracite	10 00@11 00
Coke, at yard 7c.	—
Coke, hard and soft, delivered 11cc.	—

Detroit, Mich. Feb. 15, 1876.

Specially reported by Messrs. ROBINSON & KEYS, Dealers in all kinds of coal.

Per ton of 2000 lb.

Lehigh Lump, per ton	$10 50	Blossburg	8 50
Lehigh " prep.sizes.	10 00	Briar Hill	7 50
Wilkes-Barre, Grate and Egg	9 00	Willow Bank	7 00
		Erie	50
Wilkes-Barre, Stove and Nut	9 50	Massillon	7 00

Erie, Pa. Feb. 15, 1876.

Wholesale, per ton of 2000 lb. Bituminous f. o. b.

Briar Hill lump	$3 75	Beaver lump	$3 50
Midway	3 25	Cat Fish	3 00

Louisville, Ky. Feb. 15, 1876.

Specially reported by Messrs. BYRNE & SPEED.

WHOLESALE.

	per bushel		per bushel
Pittsburgh	10c	Pine Hill	—
Raymond City	9c.	Kentucky	—

RETAIL.

	per bushel		per bushel
Pittsburgh	14c.	Peytona Cannel	20@22c.
Raymond City	13c.	Buckeye "	—
Pine Hill	13c.	City-made Coke	11c
Kentucky	12c.	Auth., per ton, $10 00 to	10 50
Screened Pittsburgh per load			$3 00
Screened Raymond City			2 75
Pine Hill (Kentucky)			2 75
Cannel			$5 to 5 50

Milwaukee, Wis. Feb. 15, 1876.

Specially reported by Messrs. R. P. ELMORE & Co.

Retail price per ton of 2000 lb.

Lehigh Lump	$10 00	Briar Hill, select	$8 00
Lehigh Prepared	11 00	Blossburgh	8 00
Lackawanna (all sizes)	10 00	Cannel	8 00
Pittston	10 00	Pittsburgh	7 00
Scranton	10 00	Steam coal	5 00

Richmond, Va. Feb. 15, 1876.

Specially reported by S. H. HAWES, Dealer in Coal.

Per ton of 2240lb., f.o.b.

Kanawha Cannel	$9 00	New River Bituminous,	$4 50
" semi-Cannel	4 75	Clover Hill Coal	4 00
Coalburgh Splint	4 75	James River Bitum	3 30
Lewiston "	4 75	" " Carbonite,	5 80
Kanawha Gas coal	4 50		

Toledo, Ohio. Feb. 15, 1876.

Specially reported by Messrs. GOSLINE & BARBOUR.

Per ton of 2000 lb. on cars.

Hocking Valley	$3 40	Massillon	4 00
Straitsville	3 40	Youghiogheny	5 00
Shawnee	3 40	Blossburg	7 00@7 50
" nut	2 90	Cumberland	7 00@7 50
Briar Hill	5 50	Connellsville coke	7 00

ANTHRACITE.

Grate, screened	$7 50	Stove, screened	$7 75
Egg, "	7 50	Chestnut "	7 50
Lehigh Lump	9 00		

40 cents to $1 per ton additional for delivery at retail.

Halifax, N. S. Feb. 15, 1876.

Prices per ton of 2240 lb. in gold.

Sydney (old mines)	$4 00	Little Glace Bay	3 35
Gowrie	3 35	Blockhouse	3 35
Victoria	—	Albion (at Railroad)	4 00

Rates of Transportation on Anthracite Coal to Tide Ports.

Lehigh and Wyoming Coals. per ton of 2240 lb.	From Penn Haven.	From Mauch Chunk.	From Hazleton**	From Upper Lehigh.	From Ashley and Sugar Notch.
To ‡ Newark, N. J. (117 miles), via Central Railroad of New Jersey	2 41	2 27	2 74	2 74	2 97
‡ Mauch Chunk, Pa., via Central Railroad of N. J.	14	..	56	47	71
‡ Philipsburg, N. J., (46 miles)	91	77	1 25	1 25	1 58
Elizabethp't, (111 m.) Pt. Johns., Hoboken & South Amboy, N. J., shipping and wharfage 35c. add.	2 05	1 91	2 40	2 38	2 61
High Bridge, N. J.	2 40	1 95	2 80	2 54	2 72
Elizabeth, Cranford, Westfield & Elizabethport, for consumption, Jersey City, N. J., (121 miles) and New York, via L. V. RR.	2 41	2 27	2 74	2 74	2 97
Andover, via Delaware, Lackawanna and Western RR.	2 85	2 46	3 17	3 24	3 54
Trenton Somerset Junction and Greensburg, via P. RR. Belvidere Division	3 30	3 10	3 70	3 69	3 99
Trenton, (97 m.) for shipment, including shipping and wharfage	2 65	2 45	3 05	3 04	3 34
	2 11	1 95	2 45	2 46	2 76

From *Mauch Chunk* to *New York* (121 miles), (towing limits) and Jersey City† via Lehigh Valley RR. $2 37

From *Mauch Chunk* to *Philadelphia* (93 m.) via L. V. and L. and S. RR. and North Penn. RR 1 75

††From *Phillipsburg, N. J.* to *Hoboken* (84 m.) for shipment via Delaware Lackawanna and Western RR., Morris and Essex Division 1 14

From *Lackawanna Junction* to **Auburn, N. Y.*, (191 m.) for shipment, via Southern Central R R. in connection with Pa. and N. Y. R.R. 2 53

From *Lackawanna Junction* to *Weedsport* (201 m.), for *Rochester and Charlotte* 2 59

From *Lackawanna Junction* to *Sterling* for *Oswego, N. Y.*. 2 62

‖ To this point for all places between Rochester and Buffalo the rate is 2 53

* The rate to this point for Syracuse is 2 08

** Rates on line coal from Hazleton are 10c. per ton above these figures.

‡ The cost of unloading is to be added to these rates. No charge less than 40c. per ton will be made for any distance. Tolls from Mauch Chunk to Phillipsburg for way points will be $1 15 per ton.

§ Twenty cents per ton less when five cars at a time to one party. Provided that where the reduction makes the rate $1 a ton, or less, the rate will be $1.

† Transportation on Coal destined for re-shipment from this point is 20c. less than above rate.

†† The rate for consumption to this point is $1 80.

The distances in the above table are computed from *Mauch Chunk*. From *Ashley* to *Mauch Chunk* the distance is 51 miles, and from *upper Lehigh*, 33 miles. From *Hazleton* 24 miles, and from *Penn Haven* 8 miles.

From *Wilkes-Barre* to *Perth Amboy* via the Lehigh Valley Railroad Company, the distance is 161 miles, and from *Mauch Chunk* it amounts to 106 miles.

Schuylkill Coals. per ton of 2240 lb.	From Pine Grove	From Tamaqua.	From Port Carbon.	From Mount Carbon.	From Schuylkill Haven.
To *Port Richmond*, for shipment, via P. & R. R. R., Main Line	2 12	2 07	2 00	1 99	1 92
Philadelphia, Retail yards	2 22	2 17	2 10	2 09	2 02
Harrisburg, via Lebanon Valley Branch	1 35	2 02	1 95	1 94	1 87
Allentown, via East Pennsylvania Branch	1 70	1 65	1 58	1 57	1 50
Lancaster, and Points on Lancaster Branch, via R. & C. R.R.	1 82	1 77	1 70	1 69	1 62
Dauphin, via Schuylkill and Susquehanna Branch	85	....	1 42	1 42	1 35
Slatedale Junction via Berks and Lehigh Branch	1 88	1 83	1 76	1 75	1 68
Lebanon, via Lebanon and Tremont Branch	96	....	....	....	....

From *Tamanend* to *Catawissa*, via Catawissa and Williamsport Branch Railroad 94

From *Tamanend* to *Williamsport*, via Catawissa and Williamsport Branch Railroad 1 39

Coal sent to points on the Catawissa and Williamsport Branch will be charged one and one-half cent per ton per mile, and two cents per ton additional to Tamanend.

The rates of freight and tolls on lump and steamboat coal (except that sent to Richmond for shipment) will be twenty per cent., and on broken coal will be ten per cent. less than the above rates.

ROBERT CROOKS AND CO.'S METAL REPORT.

LIVERPOOL, Feb. 3, 1876.

PIG IRON.—Price of warrants at beginning of January was 64/, and from this an advance took place, 66/ 3d being touched about middle of the month. From this figure the market quickly fell until it reached 63/ on the 21st, but closing on that afternoon with buyers at 64/. This week business has been quiet, and the few transactions noted have been at prices ranging from 63/ 3d, down to 62/ 3d, closing yesterday with a rather better feeling at 62/ 9d cash. Makers' Iron is again further reduced. No. 1 Gartsherrie, 74/; Coltness, 78/; Summerlee, 71/ 6d; Monkland, 64/ f.o.b. Glasgow; Glengarnock, 69/ 6d; Eglinton, 64/ f.o.b. Ardrossan. Shipments for week ending 29th January, 5,746 tons. Stocks on 28th January 52,726 tons. The furnaces blowing are now 117.

FINISHED IRON.—Despite the assumption that the last Quarterly Meeting had given a tone to the trade which it had not had for some time, the result has shown that it was groundless, and business has continued exceedingly dull. Few mills are working full time, and a large number are going only half time. The spring orders are now expected, and if they come in anything like the usual quantity, they may help to sustain prices. It appears evident that before long we must have further reductions, as the reports from all the producing districts show a general depression.

CANADA PLATES.—Good cold rolled and half bright are procurable at about $15 less 4 per cent. Purchases have been made to a small extent between this price and £16, but not in quantity sufficient to establish value. Several new brands are now in the market, so there will be plenty of competition for orders coming forward.

TIN PLATES have gradually weakened in correspondence to an increasing depression reported from U. S. markets, until at date quotations are as low as any noted since the commencement of December. On the other hand, many of the leading makers hold out firmly for the advance established after the December purchases, and will not shade their quotations even for a firm offer of a good specification.

COPPER has remained unchanged during the month, and there is consequently no feature of importance to note.

TIN for the greater part of the month was very depressed, sales being made at £2 under lowest point touched in December. The result of the Dutch sales on 28th ultimo, however, showed that this low range of value was attractive to buyers, who readily bought up all lots offering, and consequently holders are now not pressing sellers at £2 10/ to £3 above the lowest figure.

LEAD.—The demand slackening somewhat prices became easier, though in many cases the reduction does not amount to more than 5/ per ton. Superior quality for white lead manufactures is in considerable request, and very little cheaper.

FREIGHTS.—New York, 12/ 6d.; Boston, 7/ 6d.; Philadelphia, 12/ 6d.; Baltimore, 10/; Montreal, 30/; Quebec, 35/; Toronto, 31/; Hamilton, 31/.

JOHN H. AUSTIN & Co., quote as follows:

LONDON, Feb. 3, 1875.

ENGLISH RAILS.

American rails 50 to 60 lb. per yard, £6 2/6@£6 7/6 per ton f. o. b. Wales; American Rails 50 to 60 lb. per yard £6 2/6@£6 7/6 per ton f. o. b. East Coast; Steel rails, £6 10/@£7 10/ per ton f. o. b. Tyne and Tees; Steel rails, £8 10/@£9 10/ per ton f. o. b. England.

Freights.

Per ton of 2240 lb.

Representing the latest actual charters up to Feb. 17, 1876.

The following quotations are nominal, in many instances representing rates which have been ruling for some time past.

PORTS.	From Philadelphia.	From Baltimore.	From Georgetown.	From Elizabethport, Port Johnson, South Amboy, Hoboken and Weehawken.
Augusta, Me	...	2 40	....	....
Albany	*85	1 70	....	....
Amesbury, Mass	....	....	....	....
Bangor, Me	†2 00	3 00	....	2 10
Bath, Me	1 60	2 25	3 00	1 30
Baltimore	....	....	....	....
Boston, Mass	§2 00	2 00	2 50	1 30
Bridgeport, Ct	*80	1 50	2 00	90
Bristol, R. I.	....	....	2 10	1 00
Cambridgeport, Mass	§1 90	....	2 50	1 30
Derby	.. ..	1 65	....	....
Dighton	....	1 70	....	....
East Cambridge	1 90§	....	2 60	§1 30
Fall River	1 50	1 50	....	1 00
Hackensack	....	....	....	....
Hallowell, Me	....	....	....	....
Hartford	...	1 65	....	....
Hoboken	†85	1 40	1 75	40
Hudson	....	1 65	....	....
Jersey City	....	1 40	1 75	40
Lynn, Mass	†2 10	..	....	†1 30
Middletown	....	....	....	1 25
Mystic	....	....	....	....
Newark	....	1 50	....	....
New Bedford	1 50	1 60	2 10	90
Newburyport	2 10	2 25	2 65	1 50
New Haven	*80	1 50	190@2	85
New London	1 50	1 50	190@2	1 00
Newport	1 50	1 65	2 10	1 00
New York	85††	1 25	1 80	40
Norfolk, Va	85	60	60	....
Norwalk	85‡	1 50	....	80
Norwich	1 50‡	1 90	....	1 00
Pawtucket	1 75‡	1 90	2 20	....
Philadelphia	....	1 00	....	....
Portland	1 95	2 00	2 50	1 30
Portsmouth, N. H.	2 05@2 10	2 15	2 75	1 50
Providence	1 50	1 50	2 10	1 00
Petersburg, Va	....	90	....	....
Portsmouth, Va	....	....	....	....
Poughkeepsie, N. Y.	....	1 50	....	....
Richmond, Va	1 00	70	....	....
Rockport	....	....	....	....
Saco	2 50	....	....	....
Sag Harbor	....	....	....	1 00
Salem, Mass	2 00	2 00	2 60	1 80
Salisbury Pt., Mass	....	....	....	...
Savannah, Ga	....	1 50	....	....
Stamford	*80	....	....	90
Stonington	....	....	....	....
Taunton	.. .	..	....	....
Trenton, N. J	....	....	....	....
Troy	...	....	....	....
Warren, R. I.	....	....	....	1 00
Washington, D. C.	1 00	....	....	....
Wareham	....	1 75	....	....
Weymouth	2 00	2 00	2 60	....
Wilmington, Del	....	1 00	....	....
Wilmington, N. C.	....	1 50	....	....

* And discharging and towing. † And discharging. ‡ And towing. § 3c. per bridge extra.

From Baltimore and Georgetown no charters have been reported to us for the week. Our quotations from these points are therefore nominal.

IRON MARKET REVIEW.

New York.

FRIDAY EVENING, Feb. 18, 1876.

American Pig.—We are reported sales of 700 tons of Thomas iron at our quotations. There are some additional small sales reported, but they are not worthy of note. None believe that prices are fairly maintained The market is full of rumors of underselling and secret drawbacks, etc., and we should not be surprised to see the price of No. 1 foundry reduced. We quote No. 1 foundry at $23; No. 2, at $21; and forge at $18@$20.

Our Philadelphia correspondent reports a large con-

tract awarded to one of the pipe founders of that city, which it is thought will result in a call for a considerable quantity of iron.

Scotch Pig.—There has been no further arrivals. The business doing is confined to small lots. Quotations are as follows: Coltness, $32@$33; Glengarnock, $30@$31; Gartsherrie, $32.50; and Eglinton, $29.50@$30. Prices in the Glasgow market, according to cable advices, are declining. JOHN E. SWAN & BROS., of that city, under date of the 4th inst., report the stock on hand in CONNAL & Co.'s stores, at that date, at 62,028 tons, or a decrease of 698 tons from a week previous. The shipments for the week ending the 29th of January were 5,746 tons, as against 10,988 tons for the corresponding week of 1875. The shipments from Dec. 25 show a falling off of 10,754 tons as compared with last year.

Rails.—We are reported a sale of 700 tons of steel rails for shipment East. With this exception we learn of no business, and but little inquiry. We quote iron rails at mills, at $42@$45, and steel, $60@$63.

Old Rails.—There is but little inquiry. We quote at $20, at which price it is thought several lots in this market can be bought

Scrap—There is nothing doing in this article, which is nominally quoted at $30@$31.

Boston. Feb. 12, 1876.

PIG is dull indeed, the unsettled state of the coal market keeping all interest in abeyance. Holders here are stiffening up, but from what cause does not transpire, quoting No. 1, $28.50; No. 2, $26; and gray forge, $19.

BAR is having a moderate trade at $50, with here and there a dealer putting in assortments. The reports from New York on Tuesday show that that market broke from $55 to $52, and at the close was about in the most reckless state for rumors imaginable. "How will the West stand this move?" is now the question everywhere. The desirability of Gotham as a market had been preached to Boston for two months, but, however, there's no knowing what may happen; but an agreement to put values back to a remunerative basis seems to be the telegraphic advice at the close, a sort of cosmopolitan arrangement rather too universal to be impressive.

The new Rhode Island horse shoes are in $1 a keg less than a year ago, but Burden is simply distributing samples without quotations.

STEEL is selling in a quiet, steady way, with prices held a trifle more confidently.

We quote American tool, 14@15c.; American machinery, 9@9½c.; Bessemer tires, 6¾@7¼c.; SWEET's excelsior tire, 8½@12c.; English tool, 17@18c., gold.

COPPER, with a very small business and a slight decline cabled from Chili, lost ¼c. on Wednesday and closed Friday in rather an uncertain condition, buyers offering 22⅛c. for small lots and holders wanting 22⅜c.

For manufacturers we quote new sheathing 30c.; for bolts and braziers, 31c.; yellow metal bolts, 20@29c.

LEAD is in a little better request in a sort of jobbing way, with prices unchanged.

We quote pig 6c. for domestic and 6¼@6½c. for foreign; sheet and pipe lead, 9c., currency; tin-lined pipe, 10½c.; bar lead, 9c., less usual trade or 10 per cent. discount.

ANTIMONY is firm, with a small inquiry at 13½c.

SPELTER is strong and quiet at $7.45, 30 days, and $7.35, prompt cash, all currency. Silesian is dull at $7.75.

TIN, although quoting lower in London and New York, secures no increase of business, on the contrary rather stagnates the trivial interest that has been manifested for a fortnight past. The receipts of plates have been large the part week, but they come to a weak and unsatisfactory market.

We quote Straits 19c.; Banca, 23c.; Refined English 18¼@19c., gold. We quote plates charcoal I. C., $7.50; coke, $6.75@7; and terne at $6.30@6.75, gold.—*Commercial Bulletin.*

Baltimore. Feb 16, 1876.

Specially reported by Messrs R. C. HOFFMAN & Co.

The iron market remains quiet, sales light at quotations. Stocks of charcoal irons are small, and with any decided demand we look for better prices.

We quote:

Baltimore Charcoal	$32@35	Anthracite No. 3	$21@22
Virginia Charcoal	28@34	Mottled and White	18@19
Anthracite No. 1	23@24	Charcoal C B. Blooms, 75@77 50	
" No. 2	22@23	Refined Blooms	60@65

Cincinnati. Feb 15, 1876.

Specially reported by Messrs. TRABER & AUBERY, commission merchants for the sale of pig iron, blooms, ore, etc.

Our Pig Iron market has shown some signs of activity during the past week, but prices remain unchanged. We quote:

CHARCOAL.

Hanging Rock, No. 1 Foundry	$25 00@		4 mos
" No 2, "	23 00@24 00		4 mos
" Mill	22 00@		4 mos
Tennessee No. 1, Foundry	23 00@24 00		4 mos
Tennessee, No. 2, "	22 00@23 00		4 mos
" Mill	21 00@22 00		4 mos
Missouri, No. 1, Foundry	@		4 mos

STONE COAL.

Ohio, No. 1, Foundry	22 00@23 00		4 mos
" No. 2, "	21 00@22 00		4 mos
Ohio Mill	20 00@21 00		4 mos
Missouri, No. 1 Foundry	27 00@		4 mos
" No. 2, "	26 00@		4 mos
" Mill	26 00@		4 mos

CAR-WHEELS.

Hanging Rock, C. B	40 00@50 00		4 mos
Tennessee "	30 00@33 00		4 mos
Missouri "	33 00@35 00		4 mos
Alabama "	30 00@33 00		4 mos

BLOOMS.

Charcoal ..... 60 00@ 75 00—cash

SCRAP IRON.

Cast	50c.@ 65—cash
Wrought	9¼@1 10—cash

Cleveland, Ohio. Feb. 15, 1876.

Messrs. C. E. BINGHAM & Co., quote as follows:

Per gross ton, on four month's time. Subject to change in market. Discount for cash 4 per cent.

FOUNDRY IRON.

No. 1, Lake Superior Charcoal	28 00@ ..
No. 2. "	28 00@....
No. 1 Anthracite	26 50@....
No 2, "	24 00@...
No. 1, Bituminous foundry	26 5 @ ..
No 2, "	24 50@...
American Scotch, No. 1, Cherry Valley	29 50@....
" " B—1, " "	27 50@...
" " No. 2, " "	26 00@....
No. 1, Massilon	28 00@....
B—1, "	26 00@ ...
No. 2, "	23 00@

CAR WHEEL AND MALLEABLE IRON.

No. 3 Lake Superior Charcoal	27 50@....
No. 4 " " "	28 00@....
Nos. 5 and 6 " "	28 00@ ...

BESSEMER IRON.

Nos. 1 and 2 Lake Superior Charcoal	28 00@....

FORGE IRON.

No. 1, Gray	23 00@....
White and Mottled	22 00@ ..

Louisville. Feb. 15, 1876.

Specially reported by Messrs. GEORGE H. HULL & Co.

The market is dull, but without change in prices.

The usual time, four mos., is allowed on the quotations below:

HOT BLAST—CHARCOAL.

No 1 foundry, from Hanging Rock Ores	$25 00@26 00
No. 2 " " "	23 00@24 00
No. 1, Mill, from " " "	—@ —
No. 1. foundry, from Alabama, Georgia and Tennessee ores	23 00@24 00
No. 2 foundry, from Ala., Geor'a and Tenn. ores	22 00@23 00
No 1. Mill, from " " " "	21 00@22 00

HOT BLAST—STONE COAL AND COKE

No 1. foundry, from Hanging Rock ores	23 00@24 00
No 2, " " " "	22 00@23 00
No 1, Mill, " " " "	21 00@22 00
No. 1. foundry, from Ala. Ga. and Tenn. ores	23 00@24 00
No. 2, " " " "	22 00@23 00
No 1, Mill, " " " "	21 00@22 00
No. 1 foundry, from Missouri ores	24 00@25 00
No. 2 foundry, from Missouri ores	24 00@25 00
No. 1 Mill, from Missouri ores	25 00@26 00

COLD BLAST—CHARCOAL.

Car Wheel from Hanging Rock ores	35 00@40 00
" " Tennessee "	28 00@30 00
" " Alabama and Georgia ores	28 00@38 00
" " Kentucky ores	28 00@40 00

Milwaukee. Feb. 15, 1876.

The pig iron market remains much the same. Prices are as follows:

per ton of 2,240 lb.

Frankfort L. S. Charcoal, No 1		$29 00
" " "	No. 2 & 3	28 00
" " "	No. 4 & 5	31 00
" " "	No. 6	33 00
Mil. Anthracite L. S., No. 1		27 00
" " "	No. 2	26 00
Wisconsin Iron,	No. 1	25 00
Mahoning Valley Bit's No. 1		30 00
" " "	No. 2	28 00

Richmond, Va. Feb. 15, 1876.

Reported by ASA SNYDER, Esq.

Market for pig iron by no means active—although stock is very light and receipts small. Two furnaces have blown out recently, and a third will do so in a few days. There appears no weakening of the market in consequence of the small demand. We quote as per last week's table:

Virginia Cold Blast Charcoal Pig Iron		$27 to $33	
" Warm " "		24 to 28	
" " " Coke	" " 1 X	23 to 24	
" " " "	" " 2 X	21 to 22	
" " " "	" " 3	20 to 21	
" Anthracite 1 X		24 to 25	
" " 2 X		22 to 23	
" " 3		21 to 22	

St. Louis. Feb. 15, 1876.

Specially reported by Messrs. SPOONER & COLLINS, Commission Agents for all kinds of Iron.

Our market has not improved since last report. Both demand and price are very light and low. Country orders are coming in quite lively. Our mills and foundries have very light stocks on hand, and the general feeling seems to be to buy from hand to mouth only.

We quote on four months' time:

No. 1 Stone Coal No. 1 Fy.	$25@26	Massillon Iron, A No. 1.	31@32
" " " 2 "	24@25	" " B " 1.	29@30
" " Gray Mill,	24@25	" " " 2.	27@28
" Charcoal No. 1, Fdy.	24@25	Cold Bl. Car Wheel, Mo.	35@40
" " " 2, "	23@24	" " " Tenn.	33@35
" " Gray Mill,	23@24	" " " Ala.	33@35
Tenn. " No. 1, Fdy.	24@25	" " " H. R.	32@33
" " " 2, "	23@24	Mo. Charcoal Blooms	60@70
" " Gray Mill,	23@24	" Scrap "	55@60
Va. Coke, No. 1, Fdy.	25@26	" " hammered Billets	75@80
" " " 2, "	24@25	Assorted Bar Iron 2 35, 90days	
" "Gray Mill,	23½@24¾	No. 1 Wrought Scrap	10 ch.
H. R. Char. No. 1, Fdy.	26@27	Heavy cast "	..95 "
" " " 2, "	24@25	Light " "	..60 "
" " Gray Mill,	24@25		

Montreal. Jan. 25, 1876.

We quote pig iron Eglinton and Clyde $21 to 21.50; Carnbroe $21 50 to 22; American $24, to 26.; Summerlie and Calder $22.00 to 23.00; Langloan and Gartsherrie $22.00 to 23.00; Coltness $22.50 to 23.50; Hematite $30.00 to 31.00. Bar, per 100 lb., Scotch and Staffordshire, $2.25 to 2.30; best do., $2.50 to 2.60. Swedes and Norway $5.00 to 5.50; Lowmoor and Bowling, $6.50 to 7.00.—*Monetary Times.*

METALS.

NEW YORK, FRIDAY EVENING Feb. 18, 1876.

The business doing in the articles of this list is very limited and confined entirely to a jobbing trade.

Gold Coin.—During the week past gold has ranged from 112½@113⅞, and closed at 113⅝.

Bullion.—The depression in fine silver bar, which has existed for a long time, is greater than a week ago, and prices have declined from ⅛ to 1c. per oz. The general quotation at the close of business to-day was $1.18, although we are quoted as low as $1.17⅛ per oz. The San Francisco and the London markets are reported by telegraph to-day as being dull. The quotation in the former city is 9 per cent. discount, and in the latter 54d. per oz. Fine bar gold continues steady at ⅛ per cent. premium in this city, and par ($20.67, gold, per oz.) in San Francisco. The London market is quoted at 84/ 7¼d

Tin Plates.—Under a limited jobbing demand tin plates are quoted as follows—prices in gold per box: Charcoal tins, $7 75 and ternes, $7 37½@$7 50; coke tins, $6 62½@$6 75, and ternes, $6 37½@$6 50.

Lead.—This morning the Government announced that it would withdraw its lead from the market for this month, and would offer for sale but two hundred tons per month in the future. Previous to this the price was 6¼c., gold, after which there were buyers at 6⅜c., and sellers price unknown. The stock here is but about 1 500 tons with only small quantities to arrive before May. St. Louis soft is quoted at 7.58c., currency, here. Ordinary Missouri is so unsettled by the action of the Government as to be without any fixed quotation. Foreign is nominal at 7c. gold.

Copper.—There has been a little more business doing this week. Sales are reported aggregating about 500,000 pounds at 22¼@22¾c. The asking prices to-day are 22¾@22¾c. Chili Bars in London are quoted at £79@£79 10/, and best selected £87.

COPPER.—Messrs. JAMES & SHAKESPEARE report under date of Feb. 5 as follows:

Nothing doing in furnace material, the prices asked by importers precluding any purchase by smelters, except when compelled thereto by actual necessity.

Bars found tolerably ready buyers at £80 15/ up to $81 5/ per ton for good ordinary brands; but the highest figure was only attainable when sellers were able to supply metal lying at Swansea, and of a particular importation, of which the quality was supposed to be exceptionally good.

Australian sorts are neglected, and it would require a rather considerable reduction in price to induce an extensive demand

English descriptions are likewise dull, and lower in value; the competition being so great that manufacturers are selling at a considerable loss, and some therefore talk of closing their works, rather than carry on so unsatisfactory a trade.

The following tables show the statistical position according to the Board of Trade returns:—

IMPORTS.

	Jan. 1 to Dec. 31. 1875.	1874.
	Tons.	Tons.
Copper in ore	8,091	7,188
" in Regulus	16,283	14 029
" in bars, cakes, and ingots	39,572	37,611
	63,946	58,828

EXPORTS.

Foreign Copper	14,689	24,293
Raw English Copper	11,090	10,701
Manufactured Copper	11,772	10,556
Yellow Metal	13,840	14,056
Brass	4,555	5,238
	55,946	64,844

Stocks in England and France (reduced to pure copper), also Chili chartered and afloat for same:

LIVERPOOL AND SWANSEA.

	1st February. 1876.	1875.
	Tons.	Tons
Chili—In Ore, Regulus and Barilla	1,472	916
Chili—In Bar and Ingot	11,110	11 326
LONDON.		
Foreign Copper, chiefly Australian	5,979	4,827
English Copper	50	65
HAVRE.		
Chili Bar and Barilla	1,202	2,983
Other Foreign	450	950
Actual Stocks	20,632	21,067
Chili chartered and afloat (mail advices)	7,521	9,097
Gross Totals	27,784	30,164
Price of Chili Bars (G.O.Bs.)	£81	£82½
Price of Wallaroo Cake	£89	£91½
Totals Tons	5,093	6,184

Tin.—The business in this article is only of a moderate jobbing nature. We quote: straits in lots of 500 to 1,000 pigs at 18¼c. gold, per pound, and in lots of 100 pigs and less at 18⅜@18½c; L. & F. in 5-ton lots 17½c., and in lots of 1 ton and less, 18c.; Banca, 22¾c. Straits in London, according to cable advice of to-day, is quoted at £78, and Singapore $22¾ per picul.

TIN.—Our London advices dated Feb. 4th quote the tin market as still unsettled. Messrs. VON DADELSZEN & NORTH say:—"At last we seem to have found a bottom for tin, and the decision of the Dutch Trading Company not to sell their Banca below f. 50, or equal to £85 10/ in London, may prove to be the turning point in its downward course. This, although a slight thing in itself, is a sign of how the wind blows; and if it be true, as is rumored, that the Minister of the Colonies has expressed his intention of carrying out this decision during the whole year, we have reached a point below which we shall hardly go, while there are several reasons leading to the conclusion that tin is likely to improve in price and in its statistical position

"It is an acknowledged fact that the production of English tin is decreasing, while stocks in the hands of smelters are believed to be small; and as they have now no Australian ore to work with, they must follow, to a considerable extent, the foreign market.

"Although the stocks of foreign tin are, undoubtedly, large, they are at present not all available for consumption, being well held, and costing considerably over present prices; while the 'Bears,' who have been so successful for the last year, begin to see that the situation is changing, and to alter their tactics accordingly; already tin for forward delivery and to arrive, instead of being offered at 20/ to 40/ a ton under spot parcels, now realizes 10/ a ton more; and should (as we believe,) our supplies show a diminution, the increased consumption will, if slowly, still surely, show a gradual improvement in the statistical position of the article.

"The Dutch market was very inanimate, the nominal prices falling to f. 48¼ for Banca, and f. 47½ Billiton. At the Trading Company's sale of 23,031 slabs Banca on the 28th ult., 14,216 slabs were sold at f. 50, the price fixed by the Trading Company, the remainder being withdrawn altogether until next sale. Present quotations—f. 50½ for Banca, f. 49 for Billiton.

	Feb. 1, 1876. Tons.	Feb. 1, 1875. Tons.	Feb, 1 1874. Tons.	Feb.1, 1873. Tons.
Available tin in stock	7,997	5,994	4,299	2,160
Billiton and Straits afloat	1,924	1,998	1,253	555
Australian afloat, estimated	2,000	800	1,500	—
Total	11,921	8,792	7,052	2,715
Unavailable Banca in stock and afloat	2,139	3,394	3,775	4,157
Total	14 060	12,186	10,827	6,872

"Our present quotations are Straits, spot, £80 10/: to arrive and forward delivery £80 10/ to £81; Australian, £79 15/ to £80, and scarce."

"TIN PLATES were in fair demand, and makers sold pretty freely, but prices do not improve. We quote good coke from 22/ to 23/, and charcoal 27/ and upwards, f.o.b. London.

"The total exports of tin plates from the United Kingdom show again an increase, being—

1875. Boxes.	1874. Boxes.	1873. Boxes.	1872. Boxes.
2,448,986	2,143,468	2,153,477	2,083,451

the increase being mainly to other countries than America, our great consumer."

Spelter and Zinc.—Domestic spelter continues to be quoted at 7¾ c. currency, with but very little business doing. There are outside lots offering for less. Foreign continues quiet at 7·30 c.@ 7·37½c. gold. Sheet zinc is quiet at 8¾c. gold.

Antimony.—With only a moderate business doing, this article, for ordinary quantities, is quoted at 14¾ c. gold.

Quicksilver is quoted at 65c., per lb., here; 60c. in San Francisco; and £11 in London.

FINANCIAL.

New York Stocks.

FRIDAY, Feb. 18, 1876.

The New York Stock Market is fairly active with quotations of the majority of the coal carrying stocks barely recovered from the decline noted in our last. St. Louis and Iron Mountain RR. stock continues to improve, the sales for the week amounting to nearly 2,000 shares, selling up to 25¼, and closing at 25, an advance of $3 per share on our last quotation. The January earnings of this road for the present year amount to $352,200, being an increase of $101,411 over the earnings for the same period last year.

The stock of the Maryland Coal Company has been fairly active during the week, the sales amounting to 1,200 shares, closing at an advance of nearly $1 per share. From the annual report of this company for the year 1875 we note that the total output of the Cumberland region.

for the year 1874 was	2,410,895	tons
" " 1875 "	2,342,773	"
Decrease	68,122	"

or less than three per cent.

The total shipments from the mines of the Maryland Coal Company were:

For the year 1874	265,544	tons
" " 1875	261,309	"
Decrease	4,235	"

or about one and a half per cent.

The net profit of the company, for the year 1875, amounted to $87,134.94, from which a dividend of $1.50 per share, amounting to $66,000, was paid the stockholders; this dividend being equivalent to about 8½ per cent. on the market value of the stock at the time.

The shipments of this company over the Chesapeake and Ohio Canal was as follows:

	1874. Tons.	1875. Tons.	Increase. Tons.
Entire Region	767,064	879,838	112,774
Maryland Coal Co.	155,616	196,020	40,404

The increasing prosperity of the Chesapeake and Ohio Canal, under able management, is a matter for congratulation. Affording, as it does, a water-way to tide from a point within twenty six miles of the heart of the Cumberland coal field, available for at least eight months of the year, and controlled and operated by the State of Maryland, the importance of maintaining this highway as a competitor with the railway outlets for the trade of the region, is obvious.

The American Coal Co. has declared a dividend of 4 per cent, amounting to $45,000, payable March 10th proximo. The annual statement, of this company, covering the business of 1875, shows that the receipts amounted to $825,916, which gives, deducting all charges, $89,-016.30 as the net earnings. The surplus of the company, December 31, 1874, was $247,700. Deducting from this the dividend paid in March, 1875, $45,000, there is left $202,700.57, which, with the net earnings of 1875, gives a total surplus of $291,716.87. $27,536.41, to represent depreciation on canal boats and other personal property, is deducted from this amount making their present surplus $264,180.46.

The following are the earnings and expenses of the Union Pacific Railroad Company for the years ending December 31, 1875 and 1874:

From	1875.	1874.	Increase.
Passengers	$4,546,014 34	$3,952,853 55	$303,155 79
Freight	6,641,512 27	5,664.731 33	976,780 94
Mails and express	769 317 23	727,061 77	42,255 46
Miscellaneous	236,988 25	215,228 47	21,759 78
Total	$11,993,832,09	$10,559,880 12	$1,433,951 97
Operating expenses	4 932,047 95	4,652,314 95	329,733 00
Surplus.	$7 021,784 14	$5,907,565 17	$1,104,218 97

The percentage of operating expenses in 1875 was 41 54-100 per cent., against 44 5-100 in 1874, a decrease in 1875 of 2 51-100 per cent.

Indianapolis Mineral Railroad.—From the *Railroad Gazette* we take the following with reference to the incorporation of the above road: "It is proposed to build a railroad from Indianapolis southwest about 85 miles to Sullivan on the Evansville & Crawfordsville road, with a branch from a point not yet decided on to Nashville and possibly Bedford. The road is intended to develop the coal and other mineral resources of the country through which it will pass. The main line would about bisect the triangle formed by the Terre Haute & Indianapolis and the Indianapolis & Vincennes roads with the Evansville & Crawfordsville as a base."

Company Meetings.—The Lehigh and Wilkes-Barre Coal Co. will hold its annual meeting in Philadelphia on the 24th inst.

The Quicksilver Mining Co. will hold its annual meeting in this city on the 23d inst.

The Quincy Mining Co. will hold its annual meeting in Boston on the 1st of March proximo.

The Glenwood Coal Co. will hold its annual meeting at Scranton, Pa., on the 1st of March, proximo.

The Potomac Coal Co., of Alleghany County, Md., will hold its annual meeting in Baltimore, on the 24th inst.

The Union Pacific R. R. Co. will hold its annual meeting in Boston on the 8th of March, proximo.

Quotations and Sales of Stocks and Bonds,

For the week ending Feb. 18, 1876.

STOCKS.

	Highest	Lowest	Closing	Shares sold.
Pennsylvania Coal Co	—	—	28	275
Consolidation Coal Co	48	47¼	47½	510
Spring Mt. Coal Co	—	—	65	70
American Coal Co	—	—	57	100
Maryland Coal Co	18¼	17½	18¼	12 0
Del., Lack., and West. RR. Co.	118⅛	116	118⅛	2545
New Jersey Central RR. Co.	108¼	105¼	108¼	4575
Delaware and Hudson Canal Co.	121⅛	121	122⅛	1151
Quicksilver Mining Co. pref'd	—	—	23½	—
" " Common	17½	17	17¼	300
Mariposa Land & Min. Co. various.	10	8¾	8⅝	500
St. Louis & Iron Mountain RR	25¼	22	25	1945
Lehigh & Wilkes-Barre Coal Co.	—	—	40	—
Total Shares sold				19171
Sales for the week previous				8160
Increase				11011

BONDS.

	Sales.		Price	
Ches. & O. R. R. 6s, 1st. cou. on	15,000	.....	31½@	31¾
" " " ex coupon	—	.....	— @	28¼
Central RR. of N. J. 1st Mtg. N.	5,000	.....	— @	114
" " " 1st Cons.	15.000	.....	109½@	111⅜
" " " Convt.	—	.....	— @	109¾
Del. and H. Canal, 1st Mtg. 94'	20,000	.....	— @	113
" " 78, '77	—	.....	— @	102
" " Reg. '94	2,000	.....	— @	113
Del., Lack. & W. RR., 7s, conv.	—	.....	— @	118
" " " " 2d Mtg.	—	.....	— @	109
St. Louis & Iron Mount'n 1st Mtg	17,000	.....	96¾@	97
St. Louis & Iron M'tn, 2d Mtg.	—	.....	— @	68
Lehigh & Wilkes-Barre Cons.	24,000	.....	98⅛@	99
Total Sales	$98,000			

Closing quotations, in the absence of sales, represent the latest prices bid.

Philadelphia Stocks.

PHILADELPHIA, Feb 18, 1876.

The Philadelphia Stock Market has been very active during the past week, the realizing sales aggregating near 100,000 shares at a general advance throughout the list. Pennsylvania RR. stock closed at an advance of over $1 per share from the highest point recorded in our last, with sales of 48,700 shares for the week. The activity and strength of this stock is based on the anticipated increase of revenues from the Centennial business, and to rumors on the street of a favorable report of the last year's business of the company.

The *Delaware Division Canal Co.* has declared a dividend of 4 per cent., payable on demand.

Company Meetings.—The Shafton Coal Co. held its annual meeting in Philadelphia, on Feb. 14. The Allentown Iron Co. held its annual meeting in Philadelphia, on Feb. 16. The Grand Union Oil Co., of Meadville, Pa., held its annual meeting on the 16th inst. The Locust Mountain Coal & Iron Co. will hold its annual meeting in Philadelphia, on the 28th inst.

Bonds are steady and active, sales for the week amounting to $179,800.

The New York *Commercial and Financial Chronicle* says:

"Subscriptions are invited for $3,000,000 six per cent. consolidated mortgage bonds of the Pennsylvania Railroad Company, the principal and interest being payable in United States currency. The price of issue is to be 85 per cent. or £170 per bond of £200. The prospectus states that the bonds form part of a total, of £5,000,000, issued in Philadelphia, of which $2,000,000 have been placed there as registered stock. The $3,000,000 now offered are "to bearer." They are included in the same mortgage, and have precisely the same security as the Consolidated Mortgage Sterling Bonds issued in London and now quoted 98 to 99."

It seems strange that the company should offer bonds here at 85 that are now said to be worth 98 in London.

Quotations and Sales of Stocks and Bonds,

For the week ending Feb. 18, 1876.

STOCKS.

	Highest	Lowest	Closing	Shr's
Lehigh Valley RR. Co	64	61¼	64	1619
Pennsylvania RR.	56¼	54¾	56¼	48700
Reading RR.	52¼	50¼	52⅛	38750
Lehigh Coal and Nav. Co	51⅛	50½	51⅛	6759
Penn. Canal	—	—	9	—
Buck Mountain Coal Co.	—	—	*30	—
Fulton Coal Co.	—	—	3½	—
Locust Mountain Coal Co	—	—	—	—
Westmoreland Coal Co.	—	—	84	†40
St. Nicholas Coal Co.	—	—	1	—
Cambria Iron Co.	—	—	17¼	200
Crane Iron Co.	—	—	46	—
Emaus Iron Co	—	—	—	—
Pennsylvania Salt Manufact. Co.	—	—	79	169
Total shares sold				96,237
Sales for the week previous				60,254
Increase				35,983

* Asked. † Sold at auction.

BONDS.

	Sales.	Price
H. and B. T. RR. 1st mortgage, 78	—	— @109
" " " 2d " "	5 500	— @104
" " " 3d " cons	—	— @ to
Lehigh Valley RR. Con. mtg. 6s, Reg	11,000	— @100¾
" " 7s, 1910	4,000	113⅛@113⅞
" " 6s cou	—	— @104¾
Pennsylvania RR., 1st mtge. 6s	—	— @104
" gen. " cou. 1910	—	— @103½
" " gen. " 6s, reg	10,000	— @106
" " Cons. M. 6s Reg.	—	— @ 98
Phil. & Reading RR. 6s 44—80	5,000	— @103½
" " G. M. 7s, reg. & cou.	6,000	111½@112½
" " " " Deb. 6s	5,000	— @ 82
" " new convertible 7s	21,700	104½@105½
Phil. & Reading C. & I. Co. Deb. 7s	39,000	— @ 83
" " Various tracts	24,000	88 @ 89
" " Mtge. 7s	6,000	— @ 88
Lehigh Coal & Nav. Co., 6s '84	30,100	104 @103½
" " " RR., '97	100	— @102
" " " Con m. 6s	1 000	— @100½
" " Convt. gold, '97	7,000	105 @105⅛
Penn. Canal, 6s	2,000	— @ 73
Penn. and N. Y. Canal, 7s	2,000	— @ 19
Ches. and Del. Canal, 6s	400	— @ 80
Susquehanna Coal Co. 7s	—	— @ 85
Buck. Mount Coal Co. 6s	—	— @ 97¼
Penn. Gas Coal Co. 6s	—	— @100¼
Total amount of sales	$179,800	

Closing quotations, in the absence of sales, represent the latest prices bid.

Gold and Silver Stocks.

NEW YORK, Feb 18, 1876.

The mining share market is irregular and generally weak. We note but a few exceptions to a decline of the list. Caledonia exhibits an advance of $18 per share compared with our last, being quoted at $50 per share.

MINING NOTES.

From our exchanges we glean the following:

Ophir.—The east drift on the 1,100-foot level of this mine is steadily advancing, the face in quartz and low grade ore, the prospects becoming more encouraging as the drift advances. It will be remembered that this drift is running into the east country, and is in entirely virgin ground, and all the former prospecting on the upper levels of the mine having been done to the westward of the shaft. The belief is steadily gaining ground that

the drift will yet cut the top of a portion of the great bonanza ore body.

Overman.—In this mine the connection has been completed between the west drift of the 1,100-foot level and the bottom of winze from the level above. A cross-cut has now been started to cut the ledge and determine its value. The result is looked forward to with a great amount of interest, and is in reality a feature of more than ordinary consideration to all the mines on the sonth end of the Comstock.

Imperial.—Ore assaying $33 per ton has been found in the 2000-foot level of this mine.

Alps Silver Mine.—The present shipments of this Company equal $2.000 per day. Recent information is of a very flattering character. This company has declared a dividend of 25 cents per share, payable February 15th.

Eureka District, Nevada.—During the year 1875 the product of the mines in this district amounted in base bullion to 25,143,705 lb., valued at $4,233,730 14. The value of refined bullion shipped during the same period amounted to nearly $1,026,328 6, being a total product for the year of $5,260,058 20.

Eberhardt and Aurora Silver Mine (Nevada).—The profits of this mine for the year 1875, amounted to £432,000. This mine is controlled by English Capitalists.

Chicago Silver Mining Company.—This company has declared a quarterly dividend of 4 shillings per share. The stock of this company is held in London.

A telegram from Washington dated Feb. 12 states that the matter of substituting the small silver coin now in the Treasury to the amount of $12,000,000 for the fractional currency was considered in Cabinet meeting yesterday.

Dr. LINDERMAN, the director of the mint, says that the amount of silver coin on hand is $3,000,000 in dimes, $1,000,000 in twenty-cent pieces, $2,000,000 in quarters and $6,000,000 in half-dollars, and that the gold value for export or melting of a dollar of these coins is 2 per cent. less than the gold value of the greenback dollar; that the supply and demand indicate a lower rather than a higher rate for silver for some time to come, and the situation generally would justify the immediate issue of these coins in lieu of the fractional paper currency. If this could be done the annual saving to the government would be about $2,000,000.

Denver Colorado Stock Sales.—From the *Mining Review* of Feb. 7, we take the following quotations (based on the latest sales) showing the prices of various mining stocks, dealt in on the Denver stock board: Cash $20; East Roe, $6 40; Hercules and Seven-Thirty, $5; Polar Star, $4 80; Victoria, $4 25; Phil Sheridan, $2 35; and Pleasent View, $2 20 per share, respectively.

QUOTATIONS:

	No. of shares.	Feb. 10.	Feb. 17.
Sierra Nevada	100,000	20	$20
Union Consolidated	100,000	10	10
Mexican	108,000	19	19
Ophir	108,000	58	59
California	540,000	83	82
Consolidated Virginia	108,000	427	413
Best & Belcher	100,800	59	60
Gould & Curry	108,000	21	21
Savage	112,000	19	20
Hale and Norcross	16,000	47	51
Chollar Potosi	28,000	85	90
Alpha Consolidated	30,000	23	26
Imperial	100,000	8	8
Yellow Jacket	24,000	98	102
Kentuck	30,000	16	16
Crown Point	100,000	25	25
Belcher	104,000	32	37
Overman	38,400	60	66
Caledonia	20,000	32	50
Justice	105,000	27	26
Raymond & Ely	30,000	23	22
Meadow Valley	60,000	4	3
Eureka Consolidated	50,000	16	16
Eureka G. V.	20,000	3	3
Silver Hill	54,000	11	12
Julia	110,000	15	15

Copper Stocks.

Specially reported by Messrs. WILSON W. FAY & Co., Bankers and Brokers, room 7 Traveller Building, 31 State street, Boston.

BOSTON, THURSDAY EVENING, Feb 17, 1876.

There is very little doing in mining stocks to call for comment. The low ruling of the price of copper (22½c.) is, without doubt, having its effect on the market. There is a sale of about 1,000,000 lb. Lake Superior copper reported to have been made to the French Government at about 21½c.. Allouez is very firm at 26 bid. Sales have been made as high as 27, but by a party reported to have been caught short. Calumet very steady at 167. Duncan silver is a little stronger, advancing from 1⅜ to 1¾. It is said that the company have been in receipt of some very good letters from the mine lately. Pewabic is in demand at 5¾. Franklin has declined from 14½ to 12½ and since rallied to 13¼. It was sold down on the report at 1,000 shares coming on the market. Quincy is very dull, no public sales being made this week.

INCORPORATIONS.—The Luzerne Silver Mining Company of Ontonagon, Mich., has filed articles of association with the Secretary of State with a paid up capital of $500,000.

The Silver River Graphite Company, with a capital stock of $500,000, divided into 20,000 shares (all of which has been subscribed) have recently organized at L'Anse, Michigan.

Silver Islet.—We are informed that the Silver Islet Company has recently struck very rich ore at a depth of 90 fathoms, in boring with the diamond drill. Private advices state that the drill went through 12 feet of exceedingly rich native silver ore.

The developments at the Duncan Silver Mining Co. are reported as very favorable. The new winze is down 26 feet, and is still in rich ore. A piece of 3¼ pounds assayed over 2500 ounces per ton. The company is taking out about 150 to 200 pounds of such ore per week, about one ton of $75 to $100 ore, and a large amount of $15 material.

From different reliable sources we have reports of wonderfully rich silver deposits at several points on the north shore of Lake Superior; in fact it seems probable that in the near future that region will equal and perhaps surpass the wonderful Nevada deposits.

DESCRIPTION.	Par Value.	No. of Shares.	CLOSING. Bid.	Asked.
Allouez	$50	20,000	$26 00	$28 00
Calumet and Hecla	50	80,000	166 50	167
Central	25	20,000	30 00	30 50
Copper Falls	25	20,000	4 00	4 50
Dana	25	20,000	10	12½
Duncan Silver	20	60,000	1 60	1 70
Franklin	25	20,000	13 12½	13 25
Humboldt	25	20,000	10	20
Madisca	25	20,000	25	30
Mesnard	25	20,000	65	70
Minnesota	25	20,000	2 50	3 12½
National	13	20,000	2 87½	3 00
Petherick	25	20,000	40	50
Pewabic	25	20,000	5 75	6 00
Phenix	25	20,000		
Quincy	25	20,000	40 50	41 50
Ridge	25	20,000	5 75	6 25
Rockland	25	20,000	35	40
International Silver	—	—	21	23
Star	25	20,000	25	35
Superior	25	20,000	17	20
Eastern RR				

Gas Stocks.

NEW YORK, Feb. 11, 1876.

Gas stocks continue dull and heavy with but few changes from the quotations ruling in our last.

The Metropolitan Gas Company of New York, has declared a stock dividend of 5 per cent., and a scrip dividend of 3¼ per cent. equal to a disbursement of $160,000, payable on demand.

We note recent sales of the Peoples Gas Company of Baltimore, amounting to some 1,000 shares, at from 24¾ to 25⅜, this is a decline of $1 per share from the rates of this stock, which were ruling in our last.

Auction Sales of Gas Stocks.—The following were sold at auction during the week at the prices annexed: 200 shares of the Manhattan Gas Company of New York, at from 297½ to 300; 48 shares of the Peoples' Gas Company of Baltimore, at 96¼; 24 shares of the Baltimore Gas Company, at 175; 120 shares of the Laclede Gas Company of St. Louis, Mo., at 110¼; 25 shares of the Buffalo Mutual Gas Company of Buffalo, N. Y. at 50.

Boston Gas-Light Company.—It is stated that this company will reduce the price of gas on the 1st of April to $2.25 per 1,000 feet. The price in Boston previous to 1844 was $5; from that time it was gradually reduced until it reached $2.25 in 1860; during the war it rose by successive advances from $2.50 in January, 1864, to $3.25 in January, 1865; in January, 1870, it was reduced to $3, and since that time there have been three reductions.

The *Cumberland* (Md.) *Gas Co.* has reduced the price of gas from $3.50 to $3 per 1,000 feet.

Consumers' Mutual Gas-Light Co., of Baltimore, Md.—A bill incorporating the above company passed the House of Delegates, on the 7th inst. The company is to have a capital of $2,000,000, which may be increased to $3,000,000. When twenty thousand shares shall have been subscribed, upon each of which the sum of two dollars is to be paid at the time of subscription, an election of directors is to be held. Among the provisions in the company's charter are, that all the profits of the company's business, over and above eleven per cent. (ten per cent. of which is to be paid to the stockholders, and one per cent. to be retained as a reserve fund) is to be divided *pro rata* among the consumers of gas who shall have paid their bills; also that no money shall be loaned by the corporation to any stockholder therein.

New York Gas Companies. A resolution has been introduced into the New York Legislature calling on the New York gas companies for a financial report, showing a true statement of their business, embracing their incomes, dividends, and investments.

Lynn, Mass.—We see it stated that kerosene will be substituted for gas in lighting the streets of this city.

Geneva, N. Y.—The Gas Company of this place intends manufacturing gas from wood and petroleum instead of coal. It is asserted that the gas thus produced gives as pure and brilliant a light as coal gas, and can be made and supplied to customers at greatly reduced rates, which we question.

Peoples Gas Light and Coke Company of Chicago, Ill.—We see a statement that this company has negotiated a loan for some £275,000 in the London market.

Lighting the Docks and Piers of New York.—The ordinance passed by the Common Council for lighting the docks and piers of this city with gas has been vetoed by the Mayor, the veto being based on information sent in by the Commissioner of Public Works that no appropriation was in existence out of which the expense of this work could be taken.

The following list of Companies in New York and vicinity are corrected weekly by GEORGE H PRENTISS, Broker and Dealer in Gas Stocks, No. 30 Broad st., N. Y.

Quotations "bid" and "asked" of New York City and Vicinity Gas Companies are on the $100 of stock and not on one share.

Companies in New York and Vicinity.	Cap. Stk.	Par.	last Dividend	When Paid.	Bid.	Askd.
			pr.c			
Mutual, N. Y.	$5,000,000	$ 100	2½	Oct. '75	110	110½
" " Bonds	900,00	1,000	3½	Aug. "	105	
NewYork, "	4,000,000		5	Jan. '76	151	151½
Metropol. "	2,500,000	100	5	Sept. '75	160	161
" " Certf.	1,000,000	...	3½	" "	105	106
" " Bonds	500,000	1,000	3½	July, "	105	
Harlem "	1,850,000	50	4	Feb. '76	132½	134
Manhattan "	4,000,000	50	10	Jan. "	295	298
Brooklyn, B'klyn	2,000,000	25	5	Nov. '75	200	205
Nassau "	1,000,000	20	4	July, "	100	108
" " Certf.	700,000	1,000	3½	Nov. "	95	98
People's "	1,000,000	10	3½	Jan. '76	70	75
" " Certf.	300,000	1,000	3½	July, '75	85	86
" " Bds	325,000	....	3½	Aug. "		95
Metropol. "	1,000,000	10	3½	May, "	70	75
Wmsburgh "	1,000,000	50	5	July, "	—	142½
" " Certf.	1,000,000	...	3½	July, "	97	100
Citizen's "	1,200,000	20	2½	Jan. '76	104	110
" " Certf.	320,000	1,000	3½	Oct. '75	100	101
J. C. N. J.	386,000	20	5	July, "	160	170
Centl. Westch. N.Y.	466,000	50	4	July, "	100	105

‡ Gold.

Companies out of Town.†	Cap. Stk.	Par	Bid	Askd.
People's " " of J. C.			125	135
Citizen's G. L. Co., Newark, N.J.	1,000,000		75	80
Hempstead " " L. I., N.Y.	40,000	100		100
Jamaica, " " "	25,000	100		100
Richmond Co., S. I. "	300,000		100	105
Citizens', Rochester, "		100	60	68
Rochester Gas Co., "		100	50	
People's G. L. Co. Albany, "	1,000,000	100	31	40
Mutual " Buffalo "	750,000	100	50	60
Mutual " Detroit, Mich.		50	18	
TroyG. L. Co., Troy, N. Y.			108	
Brockport, N. Y., G. L. Co.	25,000	100		80
Baltimore G. L. Co., Balt., Md.	2,000,000	100	175	180
People's G. L. Co., Balt., Md	2,000,000	25¾	24	—
Hannibal G. L. Co., Hanni., Mo,	100,000	100	95	100
La Clede, Mo			110¼	125
Lewiston G. L. Co., Lewis., Me	400,000	100	33	
Chicago G. L. Co., Chicago, Ill.	2,000,000	100	140	
Jacksonville, Ill.	120,000	100	82	
Lima, Ohio	60,000	100	10	
Derby G. L. Co., Derby, Conn.	160,000	100		80
Woonskt G. L. Co. Woonskt, R.I.	150,000	100	100	
Fort Wayne G. L. Co. F. W., Ind		100	90	100
North. LibertiesG. L. Co. Phila.		25	29	
Wilkes-Barre G. L. Co W. B. Pa.		50	70	
Washington G. L. Co., Phila.			42	43
Pottsville, Pa., Gas Co.		50	40½	
Portland G. L. Co. Portland, Me	350,000	50	72	75
Hartford G. L. Co., Hartford, Ct	700,000	25	44½	
Boston G. L. Co., Boston, Mass.	2,500,000	500	780	785
Chelsea G. L. Co. Chelsea, "	300,000		139	
Cambridge G. L. Co., Cam., "	700,000		132¾	
Louisville G. L. Co., Louis., Ky.			127	
Cincinnati G. L. Co, Cincin, O.				200
St. Louis G. L. Co.		50		160
Laclede G. L. Co., St. Louis, Mo.		100		110
Carondelet G. L. Co., Mo.		50		6½
S. F. G. L. Co. San Francisco, Cal	10,000,000	100	97¾	—
City G. L. Co. Montreal, Can.	1,440,000	40	137	140
Consumers G. L(old.)Tor., Ont	600,000	50	132	
Hamilton G. L. Co., Ont.	150,000	40	112½	
Halifax G. L. Co., Halifax, N.S.	400,000	40	149	

† These quotations represent the latest obtainable prices at which sales were made.

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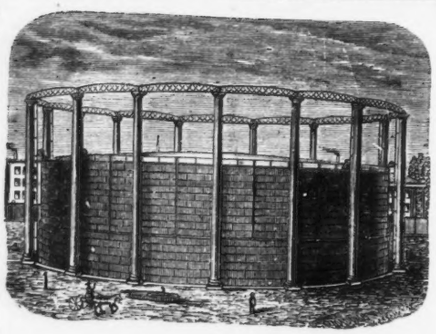

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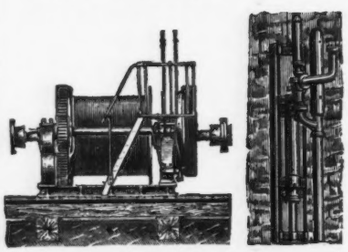

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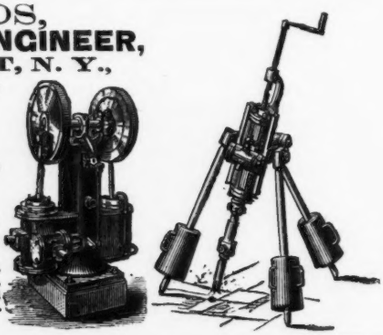

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